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THE ROLE OF SURGERY AND IRRADIATION IN CANCER OF THE BREAST

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There is today much confusion on what constitutes the best method of treating cases of operable cancer of the female breast. A review of the literature throws little light on the subject because of the widely divergent points of view expressed. Unfortunately many opinions are given which are not based on pathologic studies and on careful follow-up physical examinations.

High voltage irradiation was introduced into the armamentarium of therapy about 1923 to 1925. Few clinics in America have had sufficient cases treated by the different methods made possible by varying combinations of surgery and high voltage irradiation, especially since the introduction of the so-called divided dose method by Coutard, to have come to a positive conclusion that would be above statistical errors.

In this report I review the operable cases treated by different methods in an effort to see if it is possible to arrive at a conclusion as to which is the best method to be followed.

Any clinical experiment which involves combinations of radical mastectomy, simple mastectomy or local removal of a breast cancer, together with irradiation as a preoperative measure, or a postoperative procedure, interstitial irradiation and so on, offers no small problem. To carry out the clinical experiment it becomes necessary to lay out a program and adhere closely to it. For purposes of the study I determined to:

1. Evaluate radiation therapy as the sole agent in the cure of mammary cancer.
2. Evaluate radical surgery alone.
3. Evaluate the combination of preoperative irradiation together with radical surgery.
4. Evaluate the combination of immediate radical surgery and postoperative irradiation.
5. Evaluate the combination of simple mastectomy with axillary irradiation.

Many combinations of therapies, although they have been carried out, cannot be discussed here, as they are not within the realm of this paper. They will be considered in a later paper.

Part of the expense of the follow-up work as well as certain funds for clinical research were furnished by the Katherine Straub Cancer Fund.
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For purposes of facilitating the work, all the breast cases are classified along the following lines:

I. Malignant tumors of the breast:
   Carcinoma:
   1. Primary operable.
   2. Operable after a local excision.
   3. Primary inoperable.
   4. Recurrent inoperable.
   5. Prophylactic.
   Sarcoma:
II. Benign tumors of the breast.
III. Lesions due to injury.
IV. Inflammatory diseases of the breast.

During the past twenty-two years there have been admitted to the Breast Department of the Memorial Hospital 12,751 patients, 7,419 of whom had malignant lesions and 5,332 benign and inflammatory lesions. Every cancer case is placed in one of the groups shown in table 1, and it may be of interest to consider the relative proportion of the cases in each classification.

Primary Operable.—This classification signifies that the surgeon or radiologist still has the opportunity to cure the patient along the standard lines of radical surgery and/or irradiation. It represents that the cancer is confined to the breast and corresponding axilla. No cases involving the lungs, bones or supraclavicular area can be considered operable.

This classification represents the early or fairly early case of breast cancer. As the result in all probability of educational propaganda on the subject of cancer, the relative percentage of the operable group steadily increases. Of the 7,419 cases of cancer 47.6 per cent fell into this group, and these 3,535 cases represent the basis of the present report.

Operable After Local Excision.—This group represents those operable conditions in which a local removal of a cancer has been done before the patient has come to our hospital, where a radical mastectomy was then done. Many physicians will perform a local removal of a tumor in their office or in the hospital, when they would shudder to think of being called on to perform a radical mastectomy. My impression is that often the thought of its being cancer never comes to them before or during the operation.

This group of 283 cases represents a class that receive bad treatment. In the first place, the physician doing the operation is not trained in surgery. Second, he cuts too close to what he believes to be a benign tumor, instead of making a wide excision for an unknown tumor which later proves to be cancer. He has handled the tumor roughly and unquestionably leaves many cancer cells residual in the wound at the site of his closure.

This group of patients, therefore, is malhandled from the beginning. They often later come to the surgeon after the disease has entered the lymph nodes, infiltrates local breast tissue and at times even with a nodule or two of skin involvement.

Of the 283 cases classified as "operable after local excision" there was a five year salvage of only 53 cases,

TABLE 1.—*Classification of Cases*

Classification	Cases	
	Number	Per Cent
Primary operable	3,535	47.6
Operable after local excision	283	3.8
Primary inoperable	1,398	18.8
Recurrent inoperable	1,639	22.0
Prophylactic	539	7.2
Sarcomas	29	0.4
Total	7,419	

representing 20 per cent. Had the patient been properly handled at the beginning, she at least would have had a 51 per cent chance of five year cure.

Primary Inoperable.—This classification signifies that the patient has neglected her disease until it has passed the breast and corresponding axilla, that the disease has entered the supraclavicular space, the chest, or that distant metastasis has occurred. This represents a neglected case, a case advanced beyond the stage at which the surgeon or the radiation therapist has an opportunity for cure by their respective or combined methods.

Fortunately our clinic showed that there is a striking decrease in this group. In 1920 29 per cent of our total breast cancer cases were of this group, while in 1935 only 12 per cent were primary inoperable cases—a decrease of two and a half times the percentage of hopeless cases. Of the 1,398 cases of this group, radiation therapy has given a five year salvage in 12, which is 0.8 per cent.

Recurrent Inoperable.—This group represents patients who have been operated on elsewhere and who came to us for therapy after an irremovable recurrence had been found. As a rule this is a hopeless group. Of the 1,639 cases, 24 have been salvaged by radiation therapy and surgery, producing a 1.4 per cent salvage.

Prophylactic Group.—By this is meant that group which has had radical mastectomy before arriving at our clinic, where we give the postoperative therapy. The five year salvage is lower than anticipated, namely 15.5 per cent.

TABLE 2.—*Number of Primary Operable Cases, 1920-1942*

Total primary operable cases (22 years)	3,552
Primary operable cases of last 5 years	1,556
Primary operable cases of first 17 years	1,996
These included:	
Indeterminate cases	613
Determinate cases	1,383

There were 3,552 primary operable cases treated by a variety of methods. Table 2 gives the distribution of these cases. During the first seventeen years almost 2,000 operable cases were treated. As the result of various causes (table 3) 613 cases are not available for exact studies. It is interesting to note that only 6 per cent were actually lost to follow-up. In the age group of the cancer patient, obviously a fair number are lost from causes other than cancer, such as heart disease, diabetes, arteriosclerosis or nephritis. For the operable cases in which radiation treatment alone in the early days was given there was no method of biopsy such as aspiration, which would give an exact diagnosis and still allow irradiation. A formal surgical biopsy would not only have jeopardized the life of the patient but have precluded the delivery of adequate radiation, because the operative scar breaks down under heavy irradiation. This accounts for the 270 cases with no proved pathologic condition which had to be excluded. Today aspiration biopsy would have made it possible to include a large part of these cases. The indeterminate cases totaled 613, leaving 1,383 cases in which the pathologic condition is known, as well as the details of the five year end result.

SURGERY ONLY

Table 5 gives the results of treatment in the four large treatment classifications. Of the 194 cases treated by surgery alone without any radiation, it should be here stated that this group represents a "selected group" as evidenced by the high percentage of five year salvage, the low percentage of axillary involvement, namely 43 (table 6) and the older age level. The "surgery only" group emphasizes that selectivity is clinically proper if the end results show a high degree of success. However, from the point of view of a clinical experiment, "selection" only adds confusion.

When no axillary nodes were involved, 74.2 per cent five year salvage was obtained. This figure is approxi-

TABLE 3.—*Primary Operable Cases, 1920-1936 Inclusive, Listing Determinate Cases and Cases Which Must Be Omitted Statistically*

Total number	1,996
Died under 5 years, not of cancer	104
Died under 5 years, cause unknown	58
Lost under 5 years (6%)	121
Cancer not proved microscopically	270
Charts destroyed	53
Indeterminate cases, total	613
Determinate cases	1,383

mately the same as that obtained in the better surgical clinics where surgery alone is employed. In the cases in which there was axillary involvement the five year salvage was 47.3 per cent, which is decidedly higher than the average obtained in the average good surgical clinic. This figure immediately brings the "surgery alone" group under suspicion and emphasizes the point made by inference that any surgeon can select his patients; but what happens to those who are operable with rather bulky axillary disease who were rejected for the operation and sent to the radiation department for cure? Investigation reveals that irradiation failed to cure them. By costly experience we now know that in mammary cancer, if there is much actual bulk to be handled by radiation therapy, it will fail. In the past we sent many operable patients having at least a "chance" of cure by radical surgery to the x-ray department, where they had less opportunity for cure.

It is interesting that a few patients were treated by simple mastectomy with 71.4 per cent of five year survivals. Even 8 patients were treated by a local removal of the cancer, with 87.5 per cent five year survival. However, the number of patients so treated are too few to have statistical significance.

PREOPERATIVE IRRADIATION

Preoperative irradiation followed by the radical amputation has many adherents. On theoretical grounds this method of treatment should be one of great value.

For a period of six years we subjected every patient whose condition was operable to preliminary irradiation routinely without any suggestion of "selectivity." When one compares the results when patients are treated in this way with treatment by immediate radical mastectomy followed by irradiation a month or six weeks later, one finds that the cure rate is higher among those before their surgery given us better end results than treatment with other methods, it would have been worth the time lost, the added expense, the morbidity, poor wound healing and fibrosis of the lung. But our experience was quite the contrary. To our mind this phase of the controversial problem of the value of preoperative irradiation is definitely settled. It was a great dis-

TABLE 4.—*Primary Operable Cancer of Breast, 1920-1936 Inclusive Broken Down into Groups According to Treatment and Duration of Life Showing Totals*

Total Number of Cases	Indeterminate Cases	Cases Analyzed	Surgery Only: Radical +5	Surgery Only: Radical −5	Surgery Only: Simple +5	Surgery Only: Simple −5	Surgery Only: Local +5	Surgery Only: Local −5	Surgery Plus Preoperative Irradiation (Mostly Also Had Postoperative Irradiation): Radical +5	Surgery Plus Preoperative Irradiation (Mostly Also Had Postoperative Irradiation): Radical −5	Surgery Plus Preoperative Irradiation (Mostly Also Had Postoperative Irradiation): Simple +5	Surgery Plus Preoperative Irradiation (Mostly Also Had Postoperative Irradiation): Simple −5	Surgery Plus Preoperative Irradiation (Mostly Also Had Postoperative Irradiation): Local +5	Surgery Plus Preoperative Irradiation (Mostly Also Had Postoperative Irradiation): Local −5	Postoperative Irradiation After Surgery (Without Preoperative Irradiation): Radical +5	Postoperative Irradiation After Surgery (Without Preoperative Irradiation): Radical −5	Postoperative Irradiation After Surgery (Without Preoperative Irradiation): Simple +5	Postoperative Irradiation After Surgery (Without Preoperative Irradiation): Simple −5	Postoperative Irradiation After Surgery (Without Preoperative Irradiation): Local +5	Postoperative Irradiation After Surgery (Without Preoperative Irradiation): Local −5	Irradiation Only +5	Irradiation Only −5	Year
										Axilla Negative													
..	..	..	..	..	..	..	..	..	8	1	..	..	..	1	1	..	..	..	..	1	..	..	1920
..	..	..	1	..	..	..	..	..	1	1	..	..	..	..	2	..	..	..	..	..	..	..	1921
..	..	..	..	1	..	..	..	..	2	6	..	..	..	..	..	..	..	..	..	..	..	..	1922
..	..	..	2	..	..	..	..	..	3	2	..	..	..	..	1	..	..	..	..	..	..	..	1923
..	..	..	..	..	..	..	..	..	4	1	..	..	..	..	..	..	..	..	..	..	..	..	1924
..	..	..	..	..	..	..	..	..	8	..	..	..	..	..	..	..	..	..	..	..	..	..	1925
..	..	..	1	1	..	..	..	..	12	5	..	..	..	..	2	2	..	..	..	..	..	..	1926
..	..	..	1	..	..	..	..	..	2	4	..	..	..	..	4	..	..	..	..	..	..	..	1927
..	..	..	2	..	..	..	..	..	6	2	..	..	..	..	1	..	..	..	..	..	..	..	1928
..	..	..	3	1	..	..	..	..	10	10	..	..	..	..	4	..	..	..	..	..	..	..	1929
..	..	..	2	3	..	..	..	..	8	3	..	..	..	..	6	1	..	..	..	..	..	..	1930
..	..	..	4	3	..	..	..	..	8	2	..	..	..	..	4	..	..	..	..	..	..	..	1931
..	..	..	3	2	..	..	..	..	14	1	..	..	..	..	5	3	..	..	..	..	..	..	1932
..	..	..	11	1	..	..	..	..	1	3	..	..	..	..	17	7	..	..	..	..	..	..	1933
..	..	..	11	3	..	..	..	..	23	5	..	..	..	..	8	3	..	..	..	..	..	..	1934
..	..	..	12	3	..	..	..	..	27	11	..	..	..	..	5	2	..	..	..	..	..	..	1935
..	..	..	16	6	..	..	..	..	26	16	..	..	..	..	13	4	..	..	..	..	..	..	1936
										Axilla Positive													
..	..	..	..	..	..	..	..	..	5	3	..	..	..	..	1	..	..	..	..	..	..	..	1920
..	..	..	2	..	..	..	..	..	1	4	..	..	..	..	..	2	..	..	..	..	..	..	1921
..	..	..	..	..	..	..	..	..	5	2	..	..	..	..	..	..	..	..	..	..	..	..	1922
..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	1	..	..	..	..	..	..	..	1923
..	..	..	..	..	..	..	..	..	6	2	..	..	..	3	..	..	..	..	..	..	..	..	1924
..	..	..	..	..	..	..	..	..	6	6	..	..	..	..	..	1	..	..	..	..	..	..	1925
..	..	..	..	1	..	..	..	..	7	10	..	..	..	1	1	1	..	..	..	..	..	..	1926
..	..	..	1	1	..	..	..	..	3	14	..	..	..	..	2	1	..	..	..	..	..	..	1927
..	..	..	1	..	..	..	..	..	6	13	..	..	..	..	3	..	..	..	..	..	..	2	1928
..	..	..	1	..	..	..	..	..	6	7	1	..	..	1	3	3	..	..	..	..	..	..	1929
..	..	..	6	5	..	..	..	..	5	8	..	..	..	..	7	9	..	..	..	..	..	..	1930
..	..	..	1	4	..	..	1	..	5	13	..	..	..	..	5	11	..	..	..	..	..	..	1931
..	..	..	5	2	..	..	..	..	14	30	..	..	..	..	3	7	..	..	..	..	..	..	1932
..	..	..	2	9	..	..	..	..	3	9	..	..	..	..	17	33	..	..	..	..	..	..	1933
..	..	..	1	9	..	..	..	..	16	31	..	..	..	..	8	7	..	..	..	..	..	..	1934
..	..	..	6	2	..	..	..	..	13	28	..	..	..	..	9	9	..	..	1	..	..	..	1935
..	..	..	9	6	..	..	..	..	17	36	..	..	..	..	14	19	..	..	..	..	..	..	1936
										Axilla Questionable													
47	20	27	..	..	..	1	..	..	1	..	..	1	..	..	..	..	..	..	..	..	2	1	1920
57	32	25	..	..	..	..	..	..	..	1	..	..	1	..	..	1	4	..	..	..	1	3	1921
71	33	38	1	..	..	..	..	..	2	..	3	3	2	1	..	..	..	..	..	..	1	9	1922
62	41	21	..	..	..	..	..	..	..	1	..	2	1	1	..	..	..	..	..	1	1	2	1923
57	23	34	..	..	..	..	..	..	..	..	3	1	3	2	1	..	1	..	..	1	2	4	1924
72	34	38	..	..	..	..	..	..	..	1	2	..	..	..	..	1	1	1	1	..	4	6	1925
97	31	66	..	..	..	..	1	..	1	..	4	2	4	3	..	1	1	1	..	..	..	4	1926
90	41	49	1	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	2	10	1927
86	33	53	2	..	1	..	..	..	..	..	3	1	3	..	..	..	..	1	..	..	1	5	1928
99	36	63	..	..	..	..	..	..	..	..	3	1	..	..	..	..	1	..	1	..	3	4	1929
129	49	80	..	..	..	..	..	..	..	..	1	1	1	..	..	..	..	..	3	1	4	6	1930
134	40	94	..	1	1	..	..	..	..	1	2	3	..	..	..	..	4	..	1	..	7	13	1931
155	36	119	..	..	2	..	1	..	..	..	1	3	..	..	..	..	3	1	1	1	6	11	1932
173	21	152	..	..	1	..	3	..	..	..	5	1	2	..	..	..	3	1	2	3	1	17	1933
186	33	153	..	..	2	1	..	..	..	..	..	1	1	1	..	..	2	..	7	..	3	10	1934
211	47	164	..	..	3	1	1	..	..	..	..	3	..	..	..	..	2	2	4	..	4	16	1935
270	63	207	..	..	..	1	..	1	..	1	..	..	1	..	..	1	..	1	1	1	2	15	1936
1,996	613	1,383	108	64	10	4	7	1	286	296	29	25	19	14	148	129	22	8	22	9	44	138	Total

+5 signifies that patient survived five years; −5 signifies the patient died under five years. The table shows how every 1 of the 1,383 determinate cases was treated.

treated by the latter method. Table 5 shows that 582 patients with operable cancer were subjected to preoperative irradiation followed by radical mastectomy; 236 had no axillary involvement, of whom 163, or 69 per cent, had a five year survival. Of the 337 patients having axillary involvement 119, or 35.3 per cent, had a five year survival, with a 49.1 per cent over all survival of this group so treated.

Had our experience in the treatment of the total 669 patients who received preoperative irradiation appointment to find that only 35 per cent of the cancers located in the breast proper were sterilized by modern divided dose methods of the x-rays or the radium pack. This 35 per cent is not to be compared with the 77 per cent accomplishment of immediate radical followed by radiation therapy. Disease in the axilla is somewhat less certain of cure by irradiation. In the first place, without an operation no one can state with certainty whether the nodes are involved or not. And in the second place, possibly because of the diminished blood supply of

axillary nodes when compared to that of mammary tissue, which has a heavy blood supply, the sterilizing effect on the cancerous tissues is less than in the breast.

Another point of view will help to explain the fact that cases treated by preoperative irradiation followed by surgery do not have as high a cure rate as those treated by immediate surgery and then postoperative irradiation: this is the loss of time necessary for the irradiation to be given. This may take from four to six weeks; then, following the administration of the total dosage, it frequently requires six to eight weeks for the skin to recuperate sufficiently for surgical intervention if heavy preliminary irradiation has been used. Thus there is commonly a loss of three months. In all probability the good done by the preoperative irradiation is more than overcome by the loss of time resultant from delivering the dosage and waiting for the skin damage to repair.

as my group of "surgery only" cases is so highly selected, it may be well to study his cases in comparison with ours in order to establish a method of evaluating irradiation.

A study of table 8 reveals that the five year survival of Harrington having no involvement of the axilla was improved 5 per cent by the addition of irradiation. In his cases in which axillary involvement was present, again 5 per cent was added by irradiation. If we possessed a group of unselected cases treated by surgery alone, which we do not, we could tell how much irradiation adds; but we already know it to be of such great value that it is now too late to start to obtain an unselected group to be treated only by surgery.

Our salvage in the group having axillary involvement, 41.8 per cent, suggests the probability that selection was also used in this group. The improvement cannot be entirely attributed to the addition of irradiation. After

TABLE 5.—*Primary Operable Cancer of Breast, 1920-1936 Inclusive, Broken Down into Groups According to Node Involved, Treatment and Duration of Life*

	Surgery Only						Surgery Plus Preoperative Irradiation (Mostly Also Had Postoperative Irradiation)						Surgery Plus Postoperative Irradiation						Irradiation Only	
	Radical		Simple		Local		Radical		Simple		Local		Radical		Simple		Local			
Lived	+5	−5	+5	−5	+5	−5	+5	−5	+5	−5	+5	−5	+5	−5	+5	−5	+5	−5	+5	−5
Axilla Negative																				
Number	69	24	....	....	....	....	163	73	....	....	....	1	73	22	....	....	....	1	....	....
Per cent	74.2	25.8	....	....	....	....	69.0	31.0	....	....	....	100	76.8	23.2	....	....	....	100	....	....
Axilla Positive																				
Number	35	39	....	....	1	....	119	218	1	....	....	5	74	103	....	....	1	....	....	2
Per cent	47.3	52.7	....	....	100	....	35.3	64.7	100	....	....	100	41.8	58.2	....	....	100	....	....	100
Axilla Questionable																				
Number	4	1	10	4	6	1	4	5	28	25	19	8	1	4	22	8	21	8	44	136
Per cent	80.0	20.0	71.4	28.6	85.7	14.3	44.4	55.6	52.8	47.2	70.4	29.6	20.0	80.0	73.3	26.7	72.4	27.6	24.4	75.6
Total																				
Number	108	64	10	4	7	1	286	296	29	25	19	14	148	129	22	8	22	9	44	138
Per cent	62.8	37.2	71.4	28.6	87.5	12.5	49.1	50.9	53.7	46.3	57.6	42.4	53.6	46.4	73.3	26.7	71.0	29.0	24.2	75.8

Only cases in which a full five year follow-up was possible are included in the +5 (lived 5 years or more) group.

The morbidity from radiation therapy is often overlooked in our consideration, but, when the final chapter of therapy is written, the unhappy consequences of this agent should be given their proportionate consideration.

RADICAL MASTECTOMY AND POSTOPERATIVE IRRADIATION

Of the 277 patients treated by immediate radical mastectomy followed by irradiation, 95 had no axillary involvement. Of these 73 survived, giving a 76.8 per cent five year survival. Of the 177 patients having axillary involvement, 74 survived, giving 41.8 per cent five year survival. These figures are of prime significance because, when compared with the results of treatment by the method of preoperative irradiation followed by radical surgery, they point to a higher percentage of salvage, even though (see table 6) this group has the highest proportion of axillary involvement, namely 64 per cent. It shows that the patients who came early enough to have no axillary involvement have approximately 77 per cent salvage. It also demonstrates that, of those having axillary disease present, the added irradiation is of very great value. A study of cases with axillary involvement from grade 3 and 4 cancers reveals that radiation therapy is of great value in tumors of high malignancy.

As Harrington of Mayo Clinic has a large series of cases treated both with and without irradiation and the first thirteen years of this study the base of operability was materially broadened in order to minimize any selection of cases and conform as nearly as possible to the criterion of operability of the average surgeon. This will undoubtedly change our end result figures in the future. It will probably give worse survival figures than these here reported, but, in all probability, it will increase our percentage of five year survivals of the total.

The only criterion for effectiveness in therapy is the percentage of the total number salvaged. During the first five years, 1920 to 1924 inclusive, only 8 per cent of our total breast cancer material obtained a five year salvage. Some explanation should be attempted as to why this 375 per cent increase in over all salvage occurred. I would suggest first that the patients are coming to the surgeon earlier in the course of their disease as a result of education on the subject of cancer on the part of women. Second, as a result of coming earlier there is less bulk of axillary involvement with greatly increased opportunity for cure. Third, by experience we no longer are referring a patient with only a moderate opportunity for cure by surgery to the x-ray department, where there is less opportunity for cure. Fourth, the cure rate has gone up in those cases in which there is axillary involvement, because irradiation is here of decided value, particularly in groups 3

and 4 (on the malignancy scale). Not only does irradiation have a direct inhibitory effect on the remaining cancer cells; probably more important is the locking-up process of the cancer cells in the added scar and fibrous tissue as a result of irradiation. Here oxygenation and multiplication of cells are minimized by the unfavorable environment of the cancer cells.

At this point consideration should be given to the amount of irradiation desirable as a postoperative procedure. Common sense should be our guide. A sufficient amount should be given to control the residual axillary disease and at the same time not enough to produce lymphedema of the arm. If there is a moderate amount of axillary involvement we prescribe a total of 1,800 to 2,000 roentgens. If there is a large amount of axillary disease, with cancer spread over as far as the costoclavicular ligament, we prescribe 2,000 to 2,250 roentgens. Surgeons inadvertently produce lymphedema of the arm by infection locally or by inadequate or imperfect axillary drainage. Local cancerous disease will produce this undesirable condition: unknown causes contribute to the abnormal amount of fibrosis choking venous and lymphatic return from the arm. However, knowing that radiation given in large amounts frequently produces it, it may be wise to limit the total amount to a reasonable but effective quantity.

IRRADIATION ONLY

Authorities have stated that external irradiation, properly given, should be able to control mammary cancer. This has not been our experience. We have varied the factors of therapy in many ways to effect control, but only with modest success. We have at least proved that it is possible, by high voltage irradiation, to effect five year survivals. Of the 182 patients with operable cancer cases with biopsies given irradiation

TABLE 6.—*Radical Operations*

	Percentage of Positive Node Involvement	Percentage of Five Year Cures
Surgery only	43	63
Preoperative irradiation plus radical operation	58	49
Radical operation plus postoperative irradiation	64	54

TABLE 7.—*Five Year Survivals*

	Irradiation	Mayo Clinic	Memorial Hospital
Axilla negative	With	75.4%	76.8%
	Without	70.2%	
Axilla positive	With	29.4%	41.8%
	Without	24.3%	

only 44 (24.2 per cent) survived the five year period. This is an entirely unselected group of cases. The cure rate by irradiation (24.2 per cent) compares unfavorably with that of surgery or a combination of surgery and irradiation (table 5). Roentgen therapy for the treatment of cancer of the breast is not an efficient method in the first place, because over half the patients with operable cancer have disease both in the breast and in the corresponding axilla, the latter being poorly controlled by irradiation; and, second, mammary cancer as a rule is a resistant type of cancer.

SIMPLE MASTECTOMY

Some surgeons have become discouraged with the end results of treatment by radical mastectomy and as a result are resorting to simple mastectomy with the addition of axillary irradiation.

This movement is not confined entirely to the lowly in surgery. It seems to me that it is an unfortunate turn

TABLE 8.—*Total Numbers and Percentage Salvaged*

	Number	Per Cent
Surgery only		
Radical	172	63%
Simple	14	72%
Local	8	88%
Preoperative irradiation plus surgery		
Radical	582	49%
Simple	54	54%
Local	33	58%
Surgery plus postoperative irradiation		
Radical	277	54%
Simple	30	73%
Local	31	71%
Irradiation only	182	24%

TABLE 9.—*Results in Total Determinate Cases*

Total determinate cases	1,383
Number of patients survived five years	695
Percentage of five year survivals (including 182 cases treated by irradiation alone, which had only 24% survival)	51+

of events, because those minded in the aforementioned way are disregarding the advances made step by step in this field for a quantity as yet unknown. In the first place, patients in the average clinic will have axillary involvement of from 55 to 63 per cent. If radiation therapy could be relied on to sterilize the disease in the axilla, there would be a real rational basis for this procedure; but, unfortunately, external irradiation by itself is not sufficiently effective to be compared with the 30 to 40 per cent salvage by well done radical mastectomy in cases in which there is axillary involvement. In this series of 1,383 cases of primary operable breast cancer are included 97 cases in which a simple mastectomy was done. They represent selected cases in which we thought it reasonable on account of age, poor general condition and apparent freedom from disease to do only a simple procedure. Fourteen patients were treated with surgery only, 10 having five year survivals, 71.4 per cent. Fifty-three had preoperative irradiation followed by the simple mastectomy. Of these 28 (52.8 per cent) survived the five year period. Thirty patients were treated by simple mastectomy followed by irradiation, of whom 22 (73.3 per cent) survived the five year period.

Of course one cannot judge, when there is no available axillary material for microscopic study, as to our effectiveness in so treating this group. One can state that we were fairly fortunate in our selection of material on which to attempt this procedure.

LOCAL EXCISION

The same can be said of our 63 cases treated by local removal only of the cancer. In 7 cases treated by surgery only there were 6 (85.2 per cent) five year survivals. After preoperative irradiation, 27 patients were subjected to only a local removal of the cancer, with 19 (70.4 per cent) surviving five years. Twenty-nine

patients had immediate local removal followed by irradiation, of whom 21 (72.4 per cent) survived the five year period.

If one were to judge the results of all the cases by the accomplishment of treatment of the 97 simple mastectomies and the 63 local removals, it would appear that such local procedures would be preferable. But it would be disastrous if we were to take a step backward and do simple mastectomies and local removals of cancers as a routine. Those procedures were abolished with the advent of the present day radical mastectomy. One cannot quarrel with the careful selection of cases when, on account of age, poor general condition or other indications, the surgeon elects to carry out the less formidable procedures, provided his end results justify his choice.

It is up to the protagonists of this procedure to produce a series of cases as good as that produced by the combination of radical surgery and irradiation. We shall await with great anticipation a comprehensive report of a series of cases, statistically acceptable, so treated.

In conclusion, table 9 shows that of 1,383 patients with operable cancer carefully traced, 695 survived the five year period, giving an over all salvage of 51 per cent. This figure includes all those given irradiation alone, for whom the salvage was much lower than that of treatment by the combination of surgery and irradiation.

SUMMARY

A study of five year end results in 3,535 cases in which an attempt was made to evaluate surgery alone, preoperative irradiation, postoperative irradiation and irradiation alone in the cure of operable breast cancer revealed that the cases treated by surgery alone represented a highly selected group and do not well represent a cross section of the accomplishments of treatment by this method. Our study shows that the preferable method of treating operable breast cancer is immediate radical mastectomy combined with postoperative irradiation. In this series so treated, of those with no axillary involvement, 76.8 per cent obtained a five year survival; of those with axillary involvement, 41.8 per cent had a five year survival. This represents a higher salvage than is usually reported; the explanation is probably to be found in the following:

1. Patients with breast cancer come to the surgeon earlier than previously.

2. A partial selection of operable material takes place, which gives a higher cure rate for the operable cases but a lower cure rate for the total breast cancer material. Since the base of operability was broadened in 1933, the cure rate of operable cases will, in all probability, diminish; nevertheless we anticipate that the over all cure rate for the total material will continue to increase.

3. Modern irradiation by the divided dose method has definitely increased the salvage. The grade 3 and grade 4 cancers involving the axilla represented cases with an especially grave prognosis. Irradiation, carefully applied, has greatly improved the opportunity for cure of the grade 3 and grade 4 cancers, and it is in this group of highly malignant cancers that irradiation is most needed and of most value.

The poorest end results obtained in this study were in those unselected cases given irradiation only, namely 24 per cent.

In 695 of the total 1,383 cases, the five year period was survived, making a salvage of 51 per cent.

ABSTRACT OF DISCUSSION

DR. SHIELDS WARREN, Boston: The need for a generally accepted classification for primary cancers of the breast has been well presented. It all too frequently happens that small nonpalpable lymph nodes contain tumor and that large palpable nodes clinically considered by skilled surgeons to be metastatic are only hyperplastic or the site of extensive infiltration by fat cells. Only when large axillary nodes are fixed can clinical evidence be considered acceptable for establishing the existence of metastases. Needless to say, this inability to make a clinical determination of axillary involvement should not influence the radical operative approach. In the laboratory my associates have been studying the prognostic significance of the extent of lymph node metastasis; that is, whether a patient with two of twenty nodes involved differs significantly in outlook from one with sixteen or all of the twenty involved. While criteria of operability are not in the sphere of the pathologist, it has been my experience that in mucinous carcinoma of the breast there may be extensive ulceration of the skin and a large mass of bulky tumor without metastases having occurred, so that successful removal may be carried out. It is ordinarily possible to select the more anaplastic, rapidly growing carcinoma, and it is easy for the pathologist, as for the clinician, to recognize the totally inoperable acute carcinosis or so-called inflammatory carcinoma. With the exception of these two groups of tumors, in my hands at least, attempts at histologic grading of carcinoma of the breast have proved only a disappointment.

DR. C. D. HAAGENSEN, New York: At the Presbyterian Hospital in New York, Dr. Stout and I have been much disappointed in irradiation. Not only has it failed to cure cancer of the breast, but we have been unable to show that it actually prolongs life when used for inoperable cases. Thus we have had to fall back on surgery as the sole means of cure and have turned our attention to finding ways of using surgery more efficiently. For this purpose we need a reliable method of classifying breast cancers as curable by operation, for we have evidence to prove that operating in the incurable cases shortens life. In analyzing a series of a thousand cases at the Presbyterian Hospital we have studied some twenty-nine different clinical features which seemed to us to be of importance in estimating the true extent of the local disease. In our tabulations we use the punch card method, which we have found exceedingly convenient. We included in our tabulations all cases and did not exclude a so-called indeterminate group of cases such as Dr. Adair has done. I cannot believe that such exclusion of a selected group of cases is sound statistical practice. From our tabulations we derived a set of criteria for determining operability which we recommend for your consideration. They are (1) the inflammatory type of breast cancer, (2) cases of extensive edema of the breast, that is, when the edema involved more than a third of the skin area of the breast, (3) satellite tumor nodules in the skin over the breast, (4) edema of the arm, (5) intercostal or parasternal nodules, (6) supraclavicular metastases, (7) distant metastases, (8) development of breast tumor during pregnancy or lactation (none of our cases were cured in this group), (9) the presence of any two or more of the following signs of locally advanced breast tumor —any two or more, you will note, not any one: (*a*) ulceration of the skin, (*b*) edema of the skin of limited extent, (*c*) fixation of the tumor to the chest wall (solid fixation), (*d*) axillary lymph nodes measuring 2.5 cm. or more in transverse diameter, proved by biopsy to contain metastases if decision as to operability turns on this criterion alone, (*e*) fixation of enlarged axillary lymph nodes to overlying skin or to deep structures of axilla, again proved by biopsy to contain metastases if decision as to operability turns on this criterion alone. The application of these criteria of inoperability in the Presbyterian Hospital series of 640 radical mastectomies (1915-1934) would have obviated a total of 110 of the operations and would not have decreased the number of patients permanently cured by a single one.

DR. WILLIAM CRAWFORD WHITE, New York: Dr. Adair is to be congratulated on his careful study of the Memorial Hospital records for the past twenty-odd years. The five year survival rate in the operative cases compares favorably with those

of other clinics. But I am a little puzzled by the 41 per cent survival rate in the cases of axillary metastases. After studying the charts I think that one factor has been his exclusion of the group of cases in which death occurred without clinical evidence of cancer. I do not think that this group, as a whole, should be excluded without benefit of autopsy. In recent years postoperative roentgen therapy has been used generally. Dr. Adair feels that it has been of benefit, and I would like to believe that it is so for the comfort it would give the patient and the surgeon. But in his two tables he has presented practically the same results in cases with surgery alone and in surgery plus roentgen therapy after operation. That likewise has been our experience at the Roosevelt Hospital in a study of five year results. On the contrary, we have definitely been able to prolong the life of some patients comfortably for a short period with roentgen therapy after recurrences have been noted. Dr. Adair has had the unusual opportunity of using preoperative roentgen therapy in a large group of cases. It has given him the opportunity that comes to but few to analyze the results in this much debated procedure. He has come to the conclusion that it is not beneficial. We are indeed indebted to him for this valuable contribution. In fact, both surgery and roentgen therapy are often only palliative in the primary operable cases which have been discussed here today. Unknown to us metastases are often outside the operative field in the so-called early case. How else to explain the 25 per cent mortality from cancer within five years in the best statistics? All this boils down to the fact that our only hope for improved results rests in cancer education so that the patient may be treated more promptly.

DR. E. PAYNE PALMER, Phoenix, Ariz.: Most of us who have aided in the educational campaign in cancer feel that we have made some progress during the last quarter of a century as far as the public is concerned, but it is questionable how much progress we are making with the medical profession. Unfortunately we, the medical profession, are an egotistical class as a whole. We don't like to have some one from our town or a neighboring town come in and tell us about cancer, so we pay little attention to them. That is shown by Dr. Adair's statistics. I have been working with this problem for almost a half century. We must continue to educate the medical profession through our organizations and go ahead with our education of the public. We must teach the doctor that he must suspect cancer, that cancer of the breast is frequent and that most of the benign tumors should be removed. A specimen should be turned over to the pathologist to examine at the time of removal, and if he feels that the specimen should have a frozen section, he should do so. If he feels that it is suggestive of malignancy let him tell you to operate. I prefer to have the pathologist make the diagnosis for me. Then I feel that we are going to give the patient a better chance for a cure. Our method has been in class 1 to do a radical operation and when doing so to go as far as you can with the operation. Then we have those patients irradiated, and we have them irradiated by a man who knows what he is doing and what the dosage should be. In class 2 we give an intensive irradiation forty-eight hours before operation, just short of skin tolerance, and again twenty-four hours before. We then do the radical operation and follow up with irradiation. We have found that our results are better by this method than by doing a radical operation and then irradiating afterward. We feel that it is the proper procedure for these patients. By this method wound healing occurs before irradiation has slowed down the healing process. The other cases, as mentioned here, should be treated radically. If you have a supraclavicular gland, do not class it as a nonoperative case but remove the gland. Such patients are going to die unless you are a radical surgeon and unless you are a radical radiologist. I feel that we should be radical surgically and radiologically.

DR. U. V. PORTMANN, Cleveland: It is impossible to expect irradiation by the technics that we use today to cure cancer of the breast. My idea is that it prolongs life and economic usefulness. Group 1 cases are those without axillary metastases. A woman coming with a tumor in the breast, without palpable nodes and with none of the indications of incurable cancer, as Dr. Haagensen pointed out, certainly should have a removal of that tumor and a microscopic examination at once. If the tumor is benign, nothing else need be done. If the tumor proves to be malignant, it is up to the surgeon to decide how radical an operation he must do. In my experience the incidence in this type of case has been 25 per cent, with 85 to 90 per cent of survival in group 1. There is a certain percentage that do not survive because the tumors have not metastasized to the axilla but elsewhere. Irradiation has been of no benefit in this group of cases. In group 2, which consists of 25 per cent of our cases, the surgical curability runs 45 to 50 per cent; 50 per cent of these patients are not cured. Therefore postoperative irradiation is indicated and the lives of some of these patients have been prolonged but the patients have not been cured by the irradiation or by the surgery. In group 3, which is 30 per cent of our cases, by operation alone only 5 per cent survived five years, and that number would have survived if nothing whatever had been done, but in that group of patients also life has been prolonged because 15 per cent of them have been well for five years. In group 4, those with distant metastases at the time they came for examination, 20 per cent of our cases, surgery could not cure nor could irradiation cure, but even then lives were prolonged with a little less than 10 per cent survival for five years. I have not yet been able to decide that preoperative irradiation is indicated. It is manifest from Dr. Adair's statistics and Dr. White's remarks that a classification for carcinoma of the breast is necessary, because, for example, in the 30 per cent recurrences in cases without axillary metastases, operations in advanced stages of the disease were being performed because there were recurrences in so few, only 10 per cent without axillary metastases.

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ENCEPHALITIS

EASTERN AND WESTERN EQUINE AND ST. LOUIS TYPES, AS OBSERVED IN 1941 IN WASHINGTON, ARIZONA, NEW MEXICO AND TEXAS

W. McD. HAMMON, M.D., DR.P.H.
SAN FRANCISCO

From studies made on the encephalitides in the United States and Canada during the last decade, the evidence favors setting apart from the many types a group of virus infections which appear to be arthropod borne. These infections have come to be known as western equine and eastern equine encephalomyelitis and St. Louis encephalitis. Now, however, they are recognized to be no longer limited geographically to east and west or in host range to horse and man. Epidemiologically and clinically they are closely related. It would seem reasonable, therefore, to classify them as members of an increasingly large group of diseases which might well be called arthropod borne virus encephalitides and to consider and study them together.

TABLE 1.—*Results of Neutralization Tests with Three Neurotropic Viruses on Serums from Patients with a Clinical Diagnosis of Virus Encephalitis, Summer of 1941*

	Total Tested	Positive to Eastern Equine	Total Positive to Western Equine	Total Positive to St. Louis	Positive to Western Equine and St. Louis
Yakima Valley, Wash.....	24*	0	18	20	15
Pinal County, Ariz.....	18	0	6	17	5
Other Arizona areas.....	7**	..	2	3	1
Upper Rio Grande Valley....	6†	..	6	3	3
Lower Rio Grande Valley and southern Gulf Coast.....	6‡	1	0	1	0
Total.....	61	1	32	44	24

* One serum taken three days after onset found negative to all viruses; no later specimen obtained.

** Four serums taken eight days or less after onset found negative to all viruses; no later specimen obtained. (Antibody to the St. Louis virus is only occasionally encountered by the eighth day.)

† Two were not tested against the St. Louis virus.

‡ Four serums, all taken several weeks after onset, were negative to all three viruses.

In this paper the extensive epidemiologic studies made during the summer of 1941 in the relatively isolated Yakima Valley, Washington, will be summarized briefly. These studies were of a broad nature, planned in advance and observations begun several weeks before the first case occurred. Investigation of previous epidemics in this area made it possible to predict a recurrence and to outline certain problems for intensive research. In addition, observations and investigations made in other areas of the western United States will be reported. These other areas studied include Arizona, New Mexico and Texas. Part of the results from the Washington [1] and Arizona [2] investigations have been reported elsewhere in more detail, but those from other states are now presented for the first time.

It is often true that comparative studies of several relatively small outbreaks manifesting different age, sex and occupational characteristics, occurring in areas with certain topographical, agricultural and zoological differences, yield information not obtained by the study of a single, though large, epidemic. An attempt will be made to interpret some of the differences and similarities noted.

HUMAN CASES

Sufficient data for a diagnosis of a virus encephalitis were available from 69 human patients: 26 from the Yakima Valley, Washington, 18 from Pinal County, Arizona,[2] 9 from other portions of that state, 7 from northwestern Texas and southeastern New Mexico (upper Rio Grande Valley) and 9 from southern Texas and the lower Rio Grande Valley. The diagnosis was based on a combination of clinical findings, spinal fluid examinations and virus neutralization tests.[3] Only those cases are included in which the clinical diagnosis was confirmed by either spinal fluid examination or the neutralization test, both in most cases.

Virus Neutralization Tests.—In table 1 are presented the results of virus neutralization tests on 61 of the 69 patients. Unfortunately, both acute and convalescent serums were available for only 12 of the 25 Arizona cases and for but 9 of the 26 from Yakima. From patients in the latter area the titer of antibodies for the St. Louis virus was shown to increase during the interval between the two bleedings of 3 patients, and in 2 of these it also increased for the western equine virus. In 4 others an increase was demonstrated for the western equine strain only. As has been previously emphasized,[2] a positive test on a convalescent specimen cannot be attributed with certainty to the current disease unless an earlier specimen has been demonstrated to have no antibody or antibody of a lower titer. Some diagnostic significance has been attached to single positive tests for the equine viruses, since in most instances (but not all [4]) antibodies to these viruses in human beings are found only following a clinically recognized encephalitis.

Most of the Yakima cases must be attributed to the western equine virus, for antibodies to the St. Louis virus were found in the serums of many normal persons of this area. In Arizona most cases were caused by the St. Louis virus, for an increase in antibody titer for this virus was most frequently demonstrated. All those tested from the upper Rio Grande Valley neutralized the western equine virus, and 3 of 4 tested

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1. Hammon, W. McD.; Gray, J. A.; Evans, F. C., and Izumi, E. M.: Western Equine and St. Louis Encephalitis Antibodies in the Sera of Mammals and Birds from an Endemic Area, Science **94**: 305-307 (Sept. 26) 1941. Hammon, W. McD.; Reeves, W. C., and Izumi, E. M.: Mosquitoes and Encephalitis in the Yakima Valley, Washington: II. Methods for Collecting Arthropods and for Isolating Western Equine and St. Louis Viruses, J. Infect. Dis. **70**: 267 (May-June) 1942. Bang, F. B., and Reeves, W. C.: Mosquitoes and Encephalitis in the Yakima Valley, Washington: III. Feeding Habits of Culex Tarsalis Coq., a Mosquito Host of the Viruses of Western Equine and St. Louis Encephalitis, ibid. **70**: 273 (May-June) 1942. Reeves, W. C., and Hammon, W. McD.: Mosquitoes and Encephalitis in the Yakima Valley, Washington: IV. A Trap for Collecting Live Mosquitoes, J. Infect. Dis. **70**: 275 (May-June) 1942. Hammon, Reeves, Brookman, Izumi and Gjullin.[18] Hammon, Lundy, Gray, Evans, Bang and Izumi.[20] Hammon, Reeves, Brookman and Izumi.[18] Hammon, Reeves, Brookman and Gjullin.[20]

2. Meiklejohn, Gordon, and Hammon, W. McD.: Epidemic of Encephalitis, Predominantly St. Louis Type, in Pinal County, Ariz., J. A. M. A. **118**: 961-964 (March 21) 1942.

3. Hammon, W. McD., and Izumi, E. M.: A Virus Neutralization Test, Subject to Standardization: Used with Western Equine Encephalomyelitis, St. Louis Encephalitis and Mouse Adapted Poliomyelitis Viruses, J. Immunol. **43**: 149-157 (Feb.) 1942.

4. Buss and Howitt.[15] Hammon.[13]

against the St. Louis virus neutralized it also. The southern Texas cases were chiefly of unknown etiology. Bloods drawn from horses and cows in the last area indicated infection with eastern and western equine and St. Louis viruses. In every area there was evidence of the presence and activity of at least two viruses.

In Texas 1 patient was encountered with antibodies to the eastern equine virus. This was a girl 8 years of age who suffered from a relatively mild clinical encephalitis. Fever, stiffness of the neck and an increased spinal fluid cell count were reported by the physician, Dr. G. R. Daschielle of Brownsville, who saw the child once at an office visit during the early acute stage. About three weeks later, following apparent recovery, she was found, on examination by me, to have a unilateral Babinski sign with slight spasticity and overactive tendon reflexes in the same leg. She became ill during an outbreak of encephalomyelitis in horses which was proved to be due to the eastern equine virus by repeated isolation of this virus from the brains of horses.[5] This epizootic began on the Boca Chica flats at the mouth of the Rio Grande River in the area where this girl lived. Blood from an unvaccinated horse on the same ranch was tested and found to have antibodies to the eastern and the western equine viruses. This is the only case[5a] of the eastern type infection reported in man except during the 1938 outbreak in Massachusetts.

These blood serum tests, together with tests previously reported from some of these same areas,[6] and others including California,[7] Colorado[8] and North Dakota,[9] reported by others, indicate that mixed epidemics may predominate in the Western states. From the experience in Texas it is seen that all three viruses, and probably another one, may be present in the same area. The presence of another virus is postulated because bloods from a number of cases of clinical encephalitis which occurred at the time of the horse epizootic, and just after, failed to neutralize any of the three viruses known to be present. I have been informed that blood from a number of other clinically similar cases from central Texas[9a] which were examined in another laboratory also failed to neutralize these three viruses. Blood from both of these Texas groups was taken late enough to rule out St. Louis virus infection.

In table 2 it will be noted that the proportion of normal persons in the Yakima Valley with antibodies to the St. Louis virus increases with the length of residence in the valley. This was not a function of age. Similar findings were reported in 1940.[10] None of the 52 normal persons tested had antibodies to the western equine virus, although in the group tested the previous year five such were found in a group of 75 (6⅔ per cent).[11] Undiagnosed infections occur, therefore, with both viruses. In these instances the central nervous system is either not involved or only slightly involved as far as can be determined by history.

Clinical Diagnosis.—Symptoms, physical findings and clinical laboratory tests did not vary significantly from those reported previously from these and other areas.[12] At present no specific etiologic diagnosis can be made on the basis of these clinical data alone.

Sex and Age.—Table 3 presents data on sex and age from epidemics in six western areas. In Yakima in 1941 the incidence in the two sexes was equal. The previous year 81 per cent of the cases were in males,[13] The average age of the 26 patients in 1941 was conspicuously less than that of the previous season.[13] The Arizona patients, though predominantly infected by the St. Louis virus, were 60 per cent children under 12 years of age.[2] Seventy-eight per cent were males. These are in sharp contrast to the findings in the St. Louis City and County epidemic of 1933,[14] where the mean age was high and the sex distribution equal. The upper Rio Grande Valley cases were restricted almost entirely to the 50 to 70 year age group, while the lower Rio Grande and southern Gulf Coast cases were mostly in children. No significant sex differences were noted in either of these groups. The sex and age distribution for Kern County, Calif., as given by Buss and Howitt,[15] and of the St. Louis City-County outbreak have been included in the table for comparison.

Although mention has frequently been made of the high susceptibility to encephalitis during infancy and early childhood, based largely on animal experiments[16] and the one relatively small Massachusetts outbreak of

TABLE 2.—*Antibodies to St. Louis Virus in 1941 in Normal Persons Residing in the Yakima Valley, by Years of Residence*

Years of Residence in Yakima Valley	Antibodies St. Louis Virus		Per Cent Positive
	Negative	Positive	
0- 3	10	1	9.1
4- 7	5	3	40.0
8-11	4	3	
12-15	0	1	76.9
16-19	1	3	
20	5	16	
Total	25	27	51.9

5. Randall, Raymond, and Eichhorn, E. A.: Westward Spread of Eastern Type Equine Encephalomyelitis Virus, Science **93:** 595 (June 20) 1941. Mohler, J. R.: Report of the Chief of the Bureau of Animal Industry, 1941, U. S. Dept. of Agriculture, Sept. 15, 1941.

5a. Since this paper was written, 2 other cases of eastern equine infection in man have been reported from Texas. These were diagnosed on a similar basis during the summer of 1942. Boles, S. W., and Irons, J. V.: Laboratory Observations on Virus Encephalitis, Texas State J. Med. **38:** 260-264 (Aug.) 1942.

6. Meiklejohn and Hammon.[2] Hammon.[13] Hammon and Howitt.[10]

7. Howitt, Beatrice F.: Viruses of Equine and of St. Louis Encephalitis in Relationship to Human Infections in California, 1937-1938, Am. J. Pub. Health **29:** 1083-1097 (Oct.) 1939. Buss and Howitt.[15]

8. Philip, C. B.; Cox, H. R., and Fountain, J. H.: Protective Antibodies Against St. Louis Encephalitis Virus in the Serum of Horses and Man, Pub. Health Rep. **56:** 1388-1391 (July 4) 1941.

9. Breslich, P. J.; Rowe, P. H., and Lehman, W. L.: Epidemic Encephalitis in North Dakota, J. A. M. A. **113:** 1722-1724 (Nov. 4) 1939.

9a. Since this paper was written, a report of these cases has been published: Woodland, J. C., and Smith, E. M.: Acute Encephalitis; Mild Epidemic Observed at Station Hospital, Fort Sam Houston, Texas, J. A. M. A. **120:** 358 (Oct. 3) 1942.

10. Hammon, W. McD., and Howitt, Beatrice F.: Epidemiological Aspects of Encephalitis in the Yakima Valley: Mixed St. Louis and Western Equine Types, Am. J. Hyg. **35:** 163-185 (March) 1942.

11. Hammon.[13] Hammon and Howitt.[10]

12. Dingle, J. H.: The Encephalitides of Virus Etiology, New England J. Med. **225:** 1014-1022 (Dec.) 1941. Meiklejohn and Hammon.[2] Buss and Howitt.[15] Hammon.[13] Report on the St. Louis Outbreak of Encephalitis.[14]

13. Hammon, W. McD.: Encephalitis in the Yakima Valley: Mixed St. Louis and Western Equine Types, J. A. M. A. **117:** 161-167 (July 19) 1941.

14. Report on the St. Louis Outbreak of Encephalitis, Pub. Health Bull. 214, U. S. Treasury Department, Public Health Service, January 1935.

15. Buss, W. C., and Howitt, Beatrice F.: Human Equine Encephalomyelitis in Kern County, Calif., 1938, 1939 and 1940, Am. J. Pub. Health **31:** 935-944 (Sept.) 1941.

16. Sabin, A. B., and Olitsky, P. K.: Age of Host and Capacity of Equine Encephalomyelitis Viruses to Invade the Central Nervous System, Proc. Soc. Exper. Biol. & Med. **38:** 597-599 (May) 1938. King, Lester: Studies on Eastern Equine Encephalomyelitis: IV. Infection in the Mouse with Fresh and Fixed Virus, J. Exper. Med. **71:** 95-106 (Jan. 1) 1940. Sabin, A. B.: Constitutional Barriers to Involvement of the Nervous System by Certain Viruses, with Special Reference to the Role of Nutrition, J. Pediat. **19:** 596-607 (Nov.) 1941. Morgan, I. M.: Influence of Age on Susceptibility and on Immune Response of Mice to Eastern Equine Encephalomyelitis Virus, J. Exper. Med. **74:** 115-132 (Aug. 1) 1941. Schlesinger, Morgan and Olitsky.[16]

the eastern type equine infection, study of these data from some of the many western epidemics of western equine and St. Louis encephalitis (table 3) shows that age and sex incidence vary greatly. This would seem to indicate that environmental factors affecting exposure to the infection play an important role in determining both age and sex distribution. Obviously none of the earlier general statements regarding a characteristic age and sex distribution for any one of these infections are now tenable.

Case Fatality Rates.—Case fatality rates for these same western areas are presented for comparison in table 3. Variation in fatality rates may be partly dependent on age incidence, it would appear. In all instances shown in the table in which the sample is of significant size, the higher case fatality rates occurred in outbreaks when the higher age groups were principally affected. This is true regardless of whether the St. Louis or the western equine infection predominated. The data from New Mexico and Texas are too meager and incomplete to render any rate significant.

ENTOMOLOGIC ASPECTS

The following characteristics were found common to all areas studied: (1) annual epizootics of encephalomyelitis in horses, (2) an epidemic of human encephalitis, (3) intermittent flooding (in most instances irrigation), (4) high summer temperature, (5) large numbers of mosquitoes and (6) evidence of the presence of both St. Louis and western equine viruses. Although studies made by us did not include California, the central valley areas of this state also fulfil the six conditions noted. However, another important southwestern human epidemic (St. Louis 1933) occurred under slightly different circumstances.[14] This epidemic occurred in a nonirrigated area during a summer of unusual drought. This resulted in unusual localized areas of intense Culex mosquito breeding in the stagnant sewerage and drainage ditches.

The Massachusetts human outbreak of 1938 was also of the sporadic type, occurring during a summer in which there were heavy rains in a nonirrigated area.[17] Thus, in all areas, outbreaks of encephalitis which involved man were associated with the presence of large numbers of mosquitoes. It may be concluded that epidemics may be expected in most instances to recur annually in irrigated areas; only occasionally elsewhere.

During the testing of 12,000 mosquitoes and 4,000 other arthropods for the presence of virus, during the Yakima Valley survey in 1941, St. Louis virus and western equine virus were isolated for the first time in naturally infected mosquitoes.[18] The former was found three times and the latter five times in Culex tarsalis. Although laboratory experiments showed that several Aedes mosquitoes transmit the equine virus (reviews [19]), not one was found infected among 4,353 of these which were caught and tested. To date no laboratory transmission tests have been attempted with C. tarsalis [19a] except those now in progress in Texas in our field laboratory. There, Reeves and I have just completed successful preliminary transmissions of the St. Louis virus by the bite of Culex tarsalis and several other species of mosquitoes. The epidemiologic evidence tending to incriminate C. tarsalis as a vector for both western equine and St. Louis virus has been summarized elsewhere.[20] This evidence is based on its geographic distribution, seasonal activity, selective feeding on domestic animals and the isolation of viruses from naturally infected specimens.

Mitamura's claim of the transmission of the St. Louis virus by Culex pipiens [21] has recently been confirmed by Reeves, Hammon and Izumi.[22] Moreover, it has been shown that Aedes lateralis will transmit both the St. Louis (Reeves and Hammon [23]) and the western equine virus (Reeves [24]).

TABLE 3.—*Sex, Mean Age, Deaths and Case Fatality Rates of Encephalitis in Man in Six Western Areas*

Area and Year	Predominant Type	Total Cases	Males	Females	Mean Age in Years	Deaths	Per Cent Deaths
Yakima 1940	Western equine	58	47	11	46	13	22.4
Yakima 1941	Western equine	26	13	13	25	3	11.5
Arizona 1941	St. Louis	27	21	6	17	1	3.3
Upper Rio Grande Valley 1941	Both	7	4*	2*	53*	1	...
Lower Rio Grande Valley 1941	Unknown etiology	9	3**	3**	9**	3	...
Kern County, Calif., 1938, 1939, 1940 [15]	Western equine	116	76	40	10	11	9.5
St. Louis 1933 [14]	St. Louis	1,097	539	558	40	221	20.0

* Sex and exact age of 1 patient unknown.

** Sex and exact age of 3 patients unknown.

Since overwintering of the virus in Aedes eggs appeared improbable on the basis of experiment [25] and precedent, ticks and reduviids have been considered in this role. Dermacentor andersoni [26] and Dermacentor

17. Feemster, R. F., and Getting, V. A.: Distribution of the Vectors of Equine Encephalomyelitis in Massachusetts, Am. J. Pub. Health **31:** 791-802 (Aug.) 1941. Getting, V. A.: Equine Encephalomyelitis in Massachusetts: An Analysis of the 1938 Outbreak, a Follow-Up of Cases and a Report of a Mosquito Survey, New England J. Med. **224:** 999-1006 (June 12) 1941.

18. Hammon, W. McD.; Reeves, W. C.; Brookman, Bernard; Izumi, E. M., and Gjullin, C. M.: Isolation of the Viruses of Western Equine and St. Louis Encephalitis from Culex Tarsalis Mosquitoes, Science **94:** 328-330 (Oct. 3) 1941. Hammon, W. McD.; Reeves, W. C.; Brookman, Bernard, and Izumi, E. M.: Mosquitoes and Encephalitis in the Yakima Valley, Washington: I. Arthropods Tested and Recovery of Western Equine and St. Louis Viruses from Culex Tarsalis Coquillet, J. Infect. Dis. **70:** 263 (May-June) 1942.

19. Davis.[33] Hammon, Reeves, Brookman and Gjullin.[20]

19a. Since writing this we have succeeded repeatedly in effecting transmission of both western equine and St. Louis viruses by the bite of Culex tarsalis, thus completing the evidence necessary to incriminate it as a vector of both viruses in this area. Hammon, W. McD.; Reeves, W. C., and Gray, M.: Mosquito Vectors and Inapparent Animal Reservoirs of St. Louis and Western Equine Encephalitis Viruses, read at Convention of American Public Health Association, St. Louis, during October 1942, J. Am. Pub. Health A., to be published.

20. Hammon, W. McD.; Reeves, W. C.; Brookman, Bernard, and Gjullin, C. M.: Mosquitoes and Encephalitis in the Yakima Valley, Washington: V. Summary of Case Against Culex Tarsalis Coquillet as a Vector of the St. Louis and Western Equine Viruses, J. Infect. Dis. **70:** 278 (May-June) 1942.

21. Mitamura, T.; Yamada, S.; Hazato, H.; Mori, K.; Hosoi, T.; Kitaoka, M.; Watanabe, S.; Okubo, K., and Temjin, S.: Ueber den Infektionsmodus der epidemischen Enzephalitis: Experimentelle Untersuchungen über ihre Ansteckung durch Mucken, Tr. Jap. Path. Soc. **27:** 573-580, 1937.

22. Reeves, W. C.; Hammon, W. McD., and Izumi, E. M.: Experimental Transmission of St. Louis Encephalitis Virus with Culex Pipiens Linn., Proc. Soc. Exper. Biol. & Med. **50:** 125-128 (May) 1942.

23. Reeves, W. C., and Hammon, W. McD.: To be published.

24. Reeves, W. C.: Newer Developments in Knowledge of Insect Hosts and Vectors of Western Equine and St. Louis Encephalitis, Proc. Twelfth Ann. Conf. California Mosquito Control A. (1941), 1942, pp. 23-27.

25. Merrill, M. H., and Ten Broeck, Carl: The Transmission of Equine Encephalomyelitis Virus by Aedes Aegypti, J. Exper. Med. **62:** 687-695 (Nov. 1) 1935.

26. Syverton, J. T., and Berry, G. P.: An Arthropod Vector for Equine Encephalomyelitis, Western Strain, Science **84:** 186-187 (Aug. 21) 1936.

variabilis [27] have been demonstrated to be capable of transmitting western equine and St. Louis virus, respectively, in the laboratory. A reduviid, Triatoma sanguisuga, was found infected with the western equine virus in Kansas pastures.[28] Since Culex tarsalis overwinters as an adult, it might also serve to carry the virus over from one season to another.

OTHER VERTEBRATE HOSTS

The Yakima Valley of Washington is a fertile, flat, irrigated valley encircled and subdivided by barren sagebrush hills. Several gaps are formed in these ranges of hills to the north and south by the course of the Yakima River and are so constructed that migration of wild mammals into the valley is quite improbable. This makes it unlikely that equine encephalomyelitis was introduced in this way. Wild migratory birds do enter the valley along the course of the river.

Encephalomyelitis in horses was first recognized in the valley in 1938. As is shown in table 4, there have been since 1938 annual equine and human outbreaks. Despite extensive vaccination of horses for the western equine type of infection during 1939, 1940 and 1941, cases occurred at many and scattered points throughout the valley, either distant from or in close proximity to human cases. As may be seen in the table there is no numerical relation between the number of equine and human cases. Vaccination of horses did not appear to reduce the incidence of the disease in man. These facts render it unlikely that either man or horse acquires the disease directly one from the other or through an insect vector infected by biting only these hosts. From these and other data it appears reasonable to postulate the presence of a widespread, inapparent reservoir.

As a part of the program of study during the 1941 outbreak all of the reported cases in horses were visited and the diagnosis confirmed by clinical examination or autopsy. It is likely that most of the disease in horses in the Yakima Valley was western equine encephalomyelitis, since no case was seen in a horse vaccinated by a competent veterinarian and since in our hands both subcutaneous and intranasal inoculation of the St. Louis virus has failed to produce clinical encephalitis in horses.[29]

Although numerous cases of encephalomyelitis occurred in horses in all the regions studied, no other vertebrate except man was noted to be visibly affected. In the Yakima Valley area approximately one thousand mammals and birds, equally divided between wild and domestic, were bled for serum neutralization tests against western equine and St. Louis viruses. As controls one hundred and thirty serums from an apparently encephalitis free area on Puget Sound were tested. These controls were negative. In the epidemic valley area approximately 50 per cent of the domestic fowl, 25 to 35 per cent of the domestic mammals and wild birds and 8 per cent of the wild mammals had antibodies for both St. Louis and western equine viruses. These antibodies we attribute to previous infection of a mild or inapparent nature. The detailed results of these studies are published elsewhere.[30]

Bloods from horses and cows from Texas were found positive to both these viruses and to the eastern type as well.

Previous to these surveys only a few neutralization tests had been reported on the serums of animals exposed to natural infection [31] except on horse and man. During the same season when these extensive studies were made Howitt obtained somewhat similar results in a study of the serums of domestic animals in California, though she found a lower proportion of reactors to the St. Louis virus.[32]

The eastern equine virus occasionally produces epizootic disease in certain birds.[33] Ten Broeck [34] was probably the first to use the neutralization test to determine the presence of infection in birds. He found antibodies to the eastern virus in a flock of fowls, associated with an epizootic in horses. Western equine virus has been isolated from a single prairie chicken which was shot during the course of a survey.[35]

All these viruses have now been shown repeatedly to circulate in the blood of a number of mammals and birds following subcutaneous inoculation,[36] evidence [36a] that a source for arthropod infection may be readily available. In the Yakima Valley [37] and the California Valleys [32] this potential reservoir has been shown to be predominantly domestic in nature, associated intimately with the farm, small towns and suburban areas. Elsewhere the reservoir might be of an entirely different nature, depending on the feeding habits of the vector and the species of vertebrates present in sufficiently large numbers to serve as a satisfactory reservoir.

TABLE 4.—*Approximate Number of Cases of Encephalitis in Man and Horses, Yakima Valley, 1938 to 1941*

Year	Man	Horse
1938	4	4
1939	31	800
1940	58	20
1941	26	40

PROPHYLAXIS AND CONTROL

Vaccines prepared against the eastern and western equine viruses are now available for human use from commercial firms and will probably afford protection to

27. Blattner, R. J., and Heys, F. M.: Experimental Transmission of St. Louis Encephalitis to White Swiss Mice by Dermacentor Variabilis, Proc. Soc. Exper. Biol. & Med. **48**: 707-710 (Dec.) 1941.

28. Kitselman, C. H., and Grundmann, A. W.: Equine Encephalomyelitis Virus Isolated from Naturally Infected Triatoma Sanguisuga Lec., Technical Bulletin 50, Kansas Agricultural Experiment Station, October 1940, pp. 1-15.

29. Hammon, W. McD.; Carle, B. N., and Izumi, E. M.: St. Louis Encephalitis in the Horse, Experimental and Natural, Proc. Soc. Exper. Biol. & Med. **49**: 335-340 (March) 1942.

30. Hammon, W. McD.; Lundy, H. W.; Gray, J. A.; Evans, F. C.; Bang, F., and Izumi, E. M.: A Large Scale Neutralization Survey of Certain Vertebrates as Part of an Epidemiological Study of Encephalitis of the Western Equine and St. Louis Types, J. Immunol. **43**: 75-86 (May) 1942.

31. Howitt, Beatrice F.: Comparative Susceptibility of Wild and Domestic Birds and Animals to the Western Virus of Equine Encephalomyelitis (Br. Strain) in California, J. Infect. Dis. **67**: 177-187 (Nov.-Dec.) 1940. Hammon and Howitt.[30]

32. Howitt, Beatrice F.: Relationship of St. Louis and Western Equine Viruses of Encephalitis to Man and Animals in California, Proc. Twelfth Ann. Conf. Calif. Mosquito Control A. (1941), 1942, pp. 3-23.

33. Davis, W. A.: A Study of Birds and Mosquitoes as Hosts for the Virus of Eastern Equine Encephalomyelitis, Am. J. Hyg., Sect. C **32**: 45-59 (Sept.) 1940.

34. Ten Broeck, Carl: Birds as Possible Carriers of the Virus of Equine Encephalomyelitis, Arch. Path. **25**: 759 (May) 1938.

35. Cox, H. R.; Jellison, W. L., and Hughes, L. E.: Isolation of Western Equine Encephalomyelitis Virus from a Naturally Infected Prairie Chicken, Pub. Health Rep. **56**: 1905-1906 (Sept. 26) 1941.

36. Hammon, Lundy, Gray, Evans, Bang and Izumi.[30] Davis.[33] Howitt.[31] Ten Broeck.[34]

36a. In the recent transmission experiments with both viruses referred to in footnote 19a, Culex tarsalis was successfully infected by feeding on chickens or ducks which, though showing no signs of disease, had been inoculated subcutaneously forty-eight hours previously with a small amount of a very dilute virus suspension. These mosquitoes later transmitted the virus to other fowl. This proves that these fowl can serve in nature as inapparent reservoirs for mosquito infection.

37. Hammon, Lundy, Gray, Evans, Bang and Izumi.[30] Hammon and Howitt.[30]

men as well as to horses.[38] However, in most outbreaks morbidity and fatality rates have been so low that mass immunization programs are not indicated.[39] For restricted groups bivalent or monovalent vaccine has a definite place.

From the distribution of cases in the areas we have studied and in those reported by others, together with the recently determined distribution of possible reservoirs in two areas, it becomes apparent that in these localities rural, small town and suburban areas offer the greatest exposure risk. Persons who can move into the central areas of cities at the time of an epidemic might well do so to reduce risk of infection. Individuals should, of course, adopt all the known methods for protection against mosquito bites. Communities which are sufficiently interested in protection of the human population will attempt control of mosquito breeding. This may be expected to present many difficulties and will require technics which are not employed in the control of Anopheles for malaria. Passage and enforcement of zoning regulations excluding domestic fowl and stock from residential areas might effectively reduce the number of infected mosquitoes in many of those areas in which high morbidity rates now prevail.

COMMENT AND CONCLUSIONS

1. It is suggested that eastern and western equine and St. Louis encephalitis be classed as members of a group to be called the arthropod borne virus encephalitides.

2. Outbreaks occurring in 1941 in Washington, Arizona, New Mexico and Texas were studied. Serum neutralization tests to several viruses were made on 61 patients.

3. On the basis of present knowledge an etiologic diagnosis cannot be made on the basis of clinical findings. To make a definite etiologic diagnosis it is necessary to make serologic tests on both an early and a late serum specimen, especially in a St. Louis infection.

4. The proportion of normal persons in the Yakima Valley with antibodies to the St. Louis virus increases with length of residence in the valley (0 to 3 years 9.1 per cent, 12 to 20 years 76.9 per cent). Few were found with antibody to the western equine virus.

5. Evidence was obtained indicating the presence of three and possibly four encephalitic viruses in Texas, and for the presence of at least two in each of the other areas (two isolated from the Yakima Valley).

6. From Texas is reported the first case of probable eastern equine infection in man occurring outside of the Massachusetts outbreak. The diagnosis is based on clinical history, a positive serum neutralization test on a convalescent specimen and the isolation of the virus from horses involved in the same epidemic.

7. Epidemiologic comparisons were made between each of the epidemics studied and between these and several other reported outbreaks.

8. Age and sex incidence and case fatality rates vary definitely in different areas, regardless of which virus predominates. Previous statements regarding "typical" age and sex distribution and fatality rates of epidemics due to each of these viruses must be revised. It is concluded that environmental factors of exposure strongly influence age and sex distribution and in turn the fatality rates, for these appear to be a function of age (increasing with the mean age).

9. Conditions especially favorable to mosquito breeding were present at the time of epidemics in all areas studied. In irrigated areas epidemics tended to recur annually; elsewhere sporadically as mosquito breeding conditions became favorable.

10. Culex tarsalis mosquitoes were found to be hosts of both western equine and St. Louis viruses in the Yakima area. Since these findings, C. tarsalis and several other mosquitoes, including Culex pipiens, have been demonstrated to be capable of transmitting the St. Louis infection in the laboratory. The role of mosquitoes as vectors of this disease now appears to be established.

11. Epidemiologic evidence indicates that in the Yakima Valley there is a widespread inapparent reservoir of these viruses. Strong evidence toward the incrimination of domestic animals, especially fowl, in this role is afforded by the results of neutralization tests on the serum of a large group of mammals and birds. In addition it has been demonstrated that these animals when suffering an inapparent experimental infection have virus present in the peripheral blood.

12. Vaccines against the equine viruses are available, practical and probably effective and should be used in selected groups of heavily exposed persons. Because of low encephalitis morbidity rates in most areas they are not recommended for mass immunization programs.

13. Mosquito bite protection, larva control, residence in central urban areas and animal zoning restrictions in peripheral urban areas should afford protection in many epidemic areas.

38. Schlesinger, R. W.; Morgan, I. M., and Olitsky, P. K.: Significance of Neutralizing Antibody in Experimental Equine Encephalomyelitis: Its Relation to the Disease in Man, J. A. M. A. **119:** 618-620 (June 20) 1942.

39. Hammon, W. McD.: Suggestions for the Possible Control of the American Summer Encephalitides, Correspondence, J. A. M. A. **118:** 66-68 (Jan. 23) 1942.

ABSTRACT OF DISCUSSION

DR. CARL TENBROECK, Princeton, N. J.: Equine encephalomyelitis, St. Louis encephalitis and poliomyelitis have much in common. There are three outstanding characters that I should like to discuss briefly: (1) These diseases are more prevalent in summer than at other times of the year, (2) there are localized outbreaks in different parts of the country and (3) serologic evidence shows that they have a much wider distribution than the clinical evidence indicates. The fact that these diseases are more prevalent in summer suggests transmission by biting insects. You have heard evidence for the transmission of the equine disease by mosquitoes. This may not be the only method of transmission of this virus, for in our laboratory we have been unable to get evidence for transmission by mosquitoes in natural outbreaks in pheasants. The epidemiology suggests that the St. Louis virus is also insect borne and there is other evidence to support this view, but it is not as good as with the horse virus disease. There is no evidence that poliomyelitis is transmitted by biting insects, perhaps because we have such a poor animal for laboratory experiments, but the possibility that this virus can be transmitted in this way has not been definitely ruled out. The second point, that there are localized outbreaks of these diseases, suggests that there are reservoir hosts which show no clinical evidence of disease but from which the virus may go to more susceptible animals. The evidence is getting stronger all the time that this is the condition with the horse virus, and the work of Hammon and his associates shows that it may be possible with the St. Louis virus. There is no evidence at present that this is true for poliomyelitis. The widespread distribution of neutralizing antibodies to equine encephalomyelitis virus and the St. Louis virus found by Hammon and his co-workers in a number of animals and birds and the presence of antibodies to the two viruses in the same serums are most suggestive. One thing seems clear, and that is that in future work search must be made for more than one virus in infected individuals or animals. It seems possible that clinical

disease may be due to the simultaneous infection with two or more viruses, whereas if there is a single virus present a host may often respond only by the production of neutralizing antibodies with no clinical symptoms. There are so many unsolved problems in these diseases caused by neurotropic viruses that much more work must be done before we can be positive about them.

DR. E. C. ROSENOW, Rochester, Minn.: Despite the excellent and painstaking work which has been done on the virus, the problem is still not solved. I am impressed by the fact that not only one but several types of virus were found, judging by neutralization tests even in the same host, by the vast areas covered by the epidemic and by the changes in the clinical and pathologic picture of the disease as it occurred in the center and outskirts of epidemic areas as the epidemic disappeared. By the use of special methods for the bacteriologic study of material obtained in the epidemic (1941) and by inoculation of animals by methods usually employed it has been possible to isolate and demonstrate simultaneously an encephalitic type of streptococcus and encephalitic virus, as now understood, not only in persons and horses ill with encephalomyelitis but in nine other species of animals, birds or fish manifesting symptoms or lesions of encephalitis: in dog, hog, sheep, bat, mink, chickens, goose, wild ducks, pheasant and fish. Virus and this same type of streptococcus have also been demonstrated in emulsions and filtrates of emulsions of mosquitoes and flies within the epidemic zone and proved absent remote from the epidemic. The relationship between the streptococcus and virus was not limited to their demonstration side by side in the material obtained from the nervous and other tissues affected and in other material. Encephalitis streptococcus antigen was demonstrated in persons ill with or in contact with encephalitis by the cutaneous reaction following intradermal injection of the euglobulin fraction of the serum of horses that had been immunized with the encephalitis type of streptococcus and with the euglobulin fraction of the serum of horses that had been immunized with equine encephalomyelitis virus (western type) and by the precipitation reaction. Control injections and precipitation reactions proved negative. The serum of persons, horses and other animals developed antibodies for the streptococcus as well as for virus during attacks of this disease. The encephalitis antistreptococcus serum appeared to have curative effects in the treatment of persons ill with encephalitis. The virus has been produced experimentally from the streptococcus far removed from its original source by growing it in an autoclaved medium (chick mash) which does not turn acid from prolonged growth of the streptococcus and in the brain of fish by merely adding the streptococcus to the water in which normal goldfish and rainbow trout were kept.

DR. IRVING J. SANDS, Brooklyn: Those of us who have worked with encephalitis cases since 1917 or so have become convinced that we were dealing with processes caused by different agents. We felt that there were many viruses, not one virus, and it was our conviction that the solution to the problem would rest in the hands of epidemiologists, immunologists and bacteriologists. Measles encephalitis, vaccinia and smallpox encephalitis present a different anatomic picture from mumps and German measles encephalitis. They are different even clinically. Certainly the poliomyelitis picture caused by a virus cannot at all compare with the encephalitides mentioned in the other diseases. After an attack of poliomyelitis the child is well and normal, except for the paralyses resulting from the death of a certain number of anterior horn cells. However, the child that has had Economo encephalitis remains a cripple for life. Dr. Sylvester R. Leahy and I reported a series of cases of Economo encephalitis from the Bellevue Psychiatric Hospital (Mental Disorders in Children Following Epidemic Encephalitis, THE JOURNAL, Feb. 5, 1921, p. 373). In the last decade one has not encountered any cases of Economo encephalitis. At least one does not meet postepidemic encephalitic syndromes following encephalitis as we had fifteen years ago, which would seem to indicate that there are some neutralizing antibodies or agents that completely enable an individual to recover from the type of encephalitis that we now encounter as compared with those of 1917, '25 and '28. There is another disease which is rather trying and which we have seen in the contagious disease hospital. That is the Guillain-Barré syndrome, which some of us are beginning to believe may be virus borne.

DR. MAX H. WEINBERG, Pittsburgh: It is unfortunate that the author did not dwell at all on the clinical phases. We must impress on ourselves that we are not dealing with one disease. I for one have seen quite a few cases of Economo encephalitis since 1928. Only last Sunday I saw a case in Brooklyn of postencephalitic parkinsonism with hemiparesis, which is no doubt a case of Economo encephalitis as we diagnose it clinically, and it is not over four or five years old. We must remember the clinical as well as the serologic differences between the encephalitis of St. Louis and the old one, Economo, for instance. A good many of the patients with St. Louis encephalitis, if I am not mistaken, had hemorrhagic nephritis. This was not the case with the Economo encephalitis. We get in Economo disease not so much mental as parkinsonian changes. Another difference is that Economo encephalitis did not occur in the summer. The first attack in the United States came on in the late fall of 1918. That is when the first case showed up in New York City, and all through that winter we had encephalitis. For three years we had Economo encephalitis every winter. There were differences in the type of encephalitis from year to year. The first year it was manifest mainly by lethargy; that is why the Economo form is called lethargic encephalitis. The third year there was a larger percentage of Borna cases. We must bear in mind, therefore, that in order to be able to present a picture we shouldn't bring out one phase and leave the rest out.

DR. JOSEPH W. MOUNTIN, Washington, D. C.: I should like to ask Dr. Bang to elaborate on the control measures that he briefly outlined; also to say in his judgment whether or not these control measures are susceptible of being incorporated into routine administrative practices of state and local health departments. I happen to be chief of the State Relations Division in the Public Health Service, and we are constantly being importuned to institute measures both in anticipation of an outbreak of this disease and when the disease is upon us.

DR. L. W. LARSON, Bismarck, N. D.: We had an opportunity in Bismarck to study 95 cases during 1941, which were hospitalized. The onset of the disease was invariably abrupt. The average patient complained of headache as the predominating symptom, a few complained of nausea, but very few had any vomiting. After a variable number of hours a lethargy developed. The physical findings were characterized by an absence of ophthalmic signs and of neurologic findings, which is contrary to some of the other types of encephalitis that have been reported in previous years. The severity of the disease varied a great deal. Some of the patients merged from the lethargy into an actual coma. A very few had delirium. Many of the patients with delirium were very young; in fact, I think three of the four were infants. The temperature ranged from 99.6 up to 102 or 103 F. The pulse usually rose in proportion to the temperature. The diagnosis was confusing in some instances because the patients had signs and symptoms that are too often regarded as being influenzal in nature. However, the blood findings indicated leukocytosis with monomorphonuclear increase. The diagnosis was usually based on spinal fluid findings of slight increase in pressure and definite increase in the number of white cells, which ranged from a minimum of 30 up to 500. Invariably the differential count in the spinal fluid showed a decided preponderance of lymphocytes. There were a few exceptions, however, especially in young children, in which the first spinal tap revealed a fluid with a preponderance of polymorphonuclear leukocytes. However, subsequent taps showed that this preponderance of polymorphonuclears had changed over to a preponderance of lymphocytes. The Pandy test for globulin showed a slight globulin increase, but not of any great significance. The cultures that were carried on routinely in our laboratories in the two hospitals failed to reveal the presence of any pyogenic types of organisms. Now as to the sequelae in those 95 cases, to the best of our knowledge we have no evidence of sequelae at the present time. I trust that we can make a further report of these cases to clear up the question of the sequelae. But it is obviously too early to do that.

DR. FREDERICK B. BANG, Princeton, N. J.: We are all, of course, interested in the control of this disease. It seems that the disease has a reservoir. The evidence is good that both St. Louis and western poliomyelitis are transmitted by mosquitoes and particularly by Culex tarsalis. Thus there are three ways that we might control the disease: Get rid of the reservoir. That would involve, on the basis of the present evidence, getting rid of domestic fowl, as far as Yakima is concerned. Secondly, we may get rid of Culex tarsalis. This mosquito breeds in overflows from irrigation areas. In Yakima the entire economy of the valley depends on irrigation. Thus control of the mosquito is very difficult. I think that much can be done along these lines. Finally we have the human being. We may prevent the disease in man by administration of vaccine. This is possible only for the western equine and the eastern equine, so far. This means that in an area where we can expect to see encephalitis, where it has already begun to appear during the summer, it would be a good idea for those who are continuously exposed to mosquitoes to take such a vaccine. However, since we cannot predict where and when an epidemic will occur, we do not believe that widespread vaccination should be undertaken in any group unless there is good reason for it, such as a beginning epidemic.

DOES VITAMIN A DEFICIENCY EXIST IN CLINICAL UROLITHIASIS?

A CLINICAL AND PATHOLOGIC STUDY OF NINETY-EIGHT CASES

HUGH J. JEWETT, M.D.
LOUISE L. SLOAN, PH.D.
AND
GEORGE H. STRONG, M.D.
BALTIMORE

Although experimental [1] and clinical investigations [2] have suggested a relationship between vitamin A deficiency and urolithiasis, our observations based on a study of 98 cases have failed to disclose any evidence of such a relationship in the human being. There can be no doubt that a vitamin A free diet may result in a high incidence of urinary calculi in rats, but a certain skepticism with regard to an actual clinical relationship recently has arisen. This skepticism has resulted from (1) the disagreement among different investigators with regard to the reliability of some of the tests of the light sense and the adequacy of the norms which have been used in diagnosing moderate degrees of vitamin A deficiency,[3] (2) the lack of improvement in the light sense following administration of vitamin A to certain patients with urinary calculi [4] and (3) the extensiveness of the pathologic changes associated with the urinary calculi in laboratory animals which have been deprived of vitamin A.[5]

Our investigation has consisted in a clinical study of 20 patients and a microscopic examination of 78 autopsy cases, with urinary calculi. In the clinical group we have attempted to select more reliable visual tests for vitamin A deficiency and have supplemented these subjective tests with the determinations of the level of vitamin A in the blood.

CLINICAL STUDIES

In obtaining our data, 20 patients with urolithiasis in the Brady Urological Institute [6] and 40 normal subjects comprising a control group were given the following series of tests:

1. Ophthalmoscopic examination was made of the ocular media and fundus, the visual fields were tested, and the visual acuity with correction was determined in order to exclude patients with conditions other than vitamin A deficiency which might affect the light threshold.

2. The curve of dark adaptation was determined as follows: The patient was first light adapted by having him view for three minutes an illuminated field the brightness of which was 1,100 millilamberts. At the end of this period of light adaptation a series of measurements of the light minimum or achromatic threshold was made at intervals to determine the rate of decrease in the threshold during dark adaptation. These measurements were continued for forty minutes or longer, until there was no further significant decrease in the threshold. The test field subtended a visual angle of 1 degree and was located 15 degrees to the nasal side of the fixation point. This particular region was selected for two reasons. First, the anatomic studies of Osterberg [7] showed that the concentration of rods is greatest in the region of the retina about 15 degrees from the fovea. Secondly, by making tests of the temporal rather than the nasal retina, i. e. by locating the test spot in the nasal field, we avoid testing the area bordering on the normal blind spot, where slight shifts in the direction of fixation of the eye may result in pronounced changes in the threshold.

3. At the completion of this test, when the eye was fully dark adapted, the threshold was measured at the fovea and at eighteen different locations in the nasal and temporal meridians of the visual field.

The instrument used in making the threshold measurements was devised by one of us (L. L. S.) and has been described elsewhere.[8] A description of the preexposure field has not yet been published. It consists essentially of a sheet of flashed opal glass illuminated from the rear by a bank of twelve daylight fluorescent tubes. The distance of the patient from the illuminated surface is such that the vertical dimension of the oblong screen subtends a visual angle of 53 degrees, the horizontal dimension a visual angle of 62 degrees. A circle at the center of the screen, the diameter of which subtends a visual angle of 8 degrees, is used to maintain fixation approximately at the center of the screen. The patient is allowed to direct his gaze to any point within the limits of the circle. This is less fatiguing than the attempt to maintain perfectly steady fixation in one direction.

RESULTS OF VISUAL TESTS

The average curve of dark adaptation of the 20 patients with urolithiasis and the average curve of the control group of forty normal subjects are shown

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Read before the Section on Urology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

From the James Buchanan Brady Urological Institute, the Wilmer Ophthalmological Institute and the Department of Pathology, Johns Hopkins University School of Medicine and Hospital.

Dr. Hugh W. Josephs gave many helpful criticisms and suggestions. Dr. Richard H. Follis Jr. reviewed the pathologic material. Dr. Heinz Herrmann determined the values of vitamin A in the blood.

1. Osborne, T. B., and Mendel, L. B.: The Incidence of Phosphatic Urinary Calculi in Rats Fed on Experimental Rations, J. A. M. A. **69:** 32-33 (July 7) 1917. Higgins.[5] Bliss, Livermore and Prather.[5]

2. Higgins, C. C.: Prevention of Recurrent Renal Calculi, Surg., Gynec. & Obst. **63:** 23-34 (July) 1936. Ezickson, W. J., and Feldman, J. B.: Further Studies of Vitamin A Deficiency in Individuals with Urinary Lithiasis: A Report of Further Clinical Studies and Investigations on Thirty-Six Patients, Urol. & Cutan. Rev. **43:** 302-304 (May) 1939. Long and Pyrah.[4] Ezickson and Feldman.[10]

3. Palmer, C. E.: The Dark Adaptation Test for Vitamin A Deficiency, Am. J. Pub. Health **28:** 309-315 (March) 1938. Isaacs, Bertha L.; Jung, F. T., and Ivy, A. C.: Vitamin A Deficiency and Dark Adaptation, J. A. M. A. **111:** 777-780 (Aug. 27) 1938. Booher, Lela E., and Williams, Dorothy E.: Study of Biophotometer as Means of Measuring Vitamin A Status of Human Adults, J. Nutrition **16:** 343-354 (Oct.) 1938. Sloan, Louise L.: Instruments and Technics for the Clinical Testing of Light Sense: I. Review of the Recent Literature, Arch. Ophth. **21:** 913-934 (June) 1939.

4. Long, Hilary, and Pyrah, L. N.: Role of Vitamin A Deficiency in Etiology of Renal Calculus, Brit. J. Urol. **11:** 216-232 (Sept.) 1939. Ezickson and Feldman.[10]

5. Higgins, C. C.: The Experimental Production of Urinary Calculi, J. Urol. **29:** 157-170 (Feb.) 1933. Bliss, A. R., Jr.; Livermore, G. R., and Prather, E. O., Jr.: The Relation of Vitamin A and Vitamin D to Urinary Calculus Formation, ibid. **30:** 639-652 (Dec.) 1933.

6. Brady Urological Institute history numbers 24882, 30302, 30133, 28860, 29325, 29706, 29755, 29457, 29401, 28914, 29691, 28505, 28483, 28387, 13784, 27741, 10988, 29378 and 29137; Johns Hopkins Hospital number 224565.

7. Osterberg, G.: Topography of the Layer of Rods and Cones in the Human Retina, Acta ophth., 1935, supp. 6.

8. Sloan, Louise L.: Instruments and Technics for the Clinical Testing of Light Sense: III. An Apparatus for Studying Regional Differences in Light Sense, Arch. Ophth. **22:** 233-251 (Aug.) 1939.

in chart 1. The close agreement in the two curves shows that there is no significant increase in the average threshold of the patients with kidney stones which would be expected if the majority of these patients had even moderate degrees of vitamin A deficiency. A further analysis of the data was made in order to determine

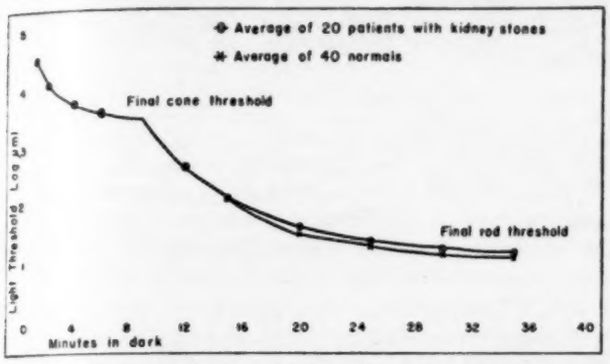

Chart 1.—Rate of decrease in threshold during dark adaptation, measured at 15 degrees from fixation point in nasal field. Average adaptation curve of (1) patients with urolithiasis and (2) control group.

whether or not any 1 of the patients with stones had dark adaptation curves above the normal range either in the first section, where the thresholds are determined primarily by the cones, or in the second section, where they are determined by the rods. The individual values of the final cone thresholds are shown in the two frequency distribution graphs of chart 2, which gives the data for the 20 patients with urolithiasis and for the control group of 40 normal subjects. The frequency distribution of the thresholds is similar for the two groups. None of the patients with kidney stones have thresholds higher than are found in the control group. The final rod thresholds (after thirty-five minutes of dark adaptation) are given in chart 3. These graphs also show similar frequency distributions for the two groups of patients; none of the patients with stones have rod thresholds higher than are found in the normal group.

The measurements of the final thresholds at nineteen different locations throughout the horizontal meridian have been analyzed in similar fashion. Chart 4 shows the average threshold gradient curves for the group of 20 patients with stones and for the 40 subjects of the control group. It is apparent that there are no signifi-

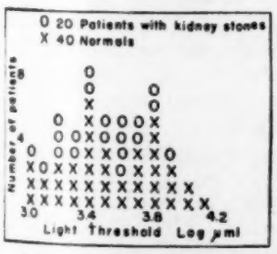

Chart 2.—Distribution of individual values of final cone threshold at 15 degrees in nasal field.

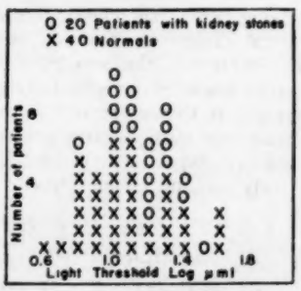

Chart 3.—Distribution of individual values of final rod threshold at 15 degrees in nasal field.

cant differences in the average threshold gradient curves of the two groups. In order to determine whether or not any of the patients with urolithiasis had thresholds outside the normal range, the average value of the threshold at the nineteen different locations was computed for each patient. These values are shown in chart 5 in the form of frequency distributions for the two groups. The graphs show that none of the patients with stones have thresholds greater than some of the subjects in the control group. There is moreover no evidence of any significant trend toward higher thresholds in the group of patients with urolithiasis.

LABORATORY STUDIES

Determinations of the concentrations of vitamin A in the blood plasma were made in the 20 cases of urolithiasis and in 33 normal controls.[9] A comparison between these two groups is made in chart 6, which shows the distribution of the individual values. None of the patients with urinary calculi had less vitamin A in the blood than the normal subjects. One subject in the control group had a rather low value for vitamin A in the blood, but this individual showed no other evidence of vitamin A deficiency. The reason for this subnormal value as yet has not been determined.

Analysis of the calculi in the 20 cases of urolithiasis showed that the calculus in 4 instances was calcium phosphate. In all of these the urine was infected, and in 2 it was alkaline. There were 7 cases in which calcium phosphate was mixed with oxalate. In 6 of these the urine was sterile and acid, but in 1 the urine was alkaline and contained Proteus vulgaris. There were

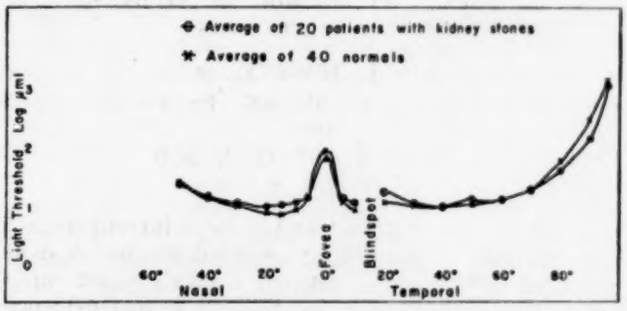

Chart 4.—Final thresholds after complete dark adaptations at nineteen locations in horizontal meridian. Average threshold gradient curves of (1) patients with urolithiasis and (2) control group.

5 cases of almost pure calcium oxalate calculi, in all of which the urine was acid and in 2 instances was infected. In the last 4 cases the stones were not recovered for analysis, and in 1 of these hyperparathyroidism was present.

Certain investigators have reported a number of cases of urolithiasis in which pathologic dark adaptation failed to improve after large doses of vitamin A.[4] In one of these reports [10] it was assumed that the failure to improve was the result of lack of assimilation or utilization of the vitamin. However, the conditions leading to inadequate assimilation or utilization of vitamin A are largely known. If they are found not to be present it has usually been accepted that failure to improve on vitamin A therapy means that the rise in the visual threshold is not due to vitamin A deficiency. Steven and Wald,[11] in their careful investigation, have confirmed this conclusion and have set up for their criterion for vitamin A deficiency a

9. The estimation of vitamin A in the blood was carried out according to Kimble's method (Kimble, M. S.: Photocolorimetric Determination of Vitamin A and Carotene in Human Plasma, J. Lab. & Clin. Med. **24**: 1055-1065 [July] 1939). For the standardization we used crystalline beta carotene and U. S. P. Reference Cod Liver Oil No. 2 containing 1,700 U. S. P. vitamin A units per gram. The final reading was made in a Klett-Summerson photoelectric colorimeter.

10. Ezickson, W. J., and Feldman, J. B.: Signs of Vitamin A Deficiency in the Eye Correlated with Urinary Lithiasis: A Report of Clinical Studies and Investigations on Twenty-Five Patients, J. A. M. A. **109**: 1706-1710 (Nov. 20) 1937.

11. Steven, David, and Wald, George: Vitamin A Deficiency: A Field Study in Newfoundland and Labrador, J. Nutrition **21**: 461-476 (May) 1941.

decrease in the visual threshold within at least two weeks of regular vitamin A supplementation. These authors assert that a visual threshold above a "normal range" is an inadequate criterion, for high visual thresholds may result from a variety of congenital and acquired abnormalities other than a deficiency in vitamin A. They state that a correlation of the threshold of the dark adapted eye with response to vitamin A therapy or with the level of vitamin A in the blood has indicated a relatively low incidence of vitamin A deficiency in the general population.

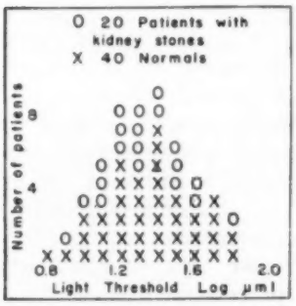

Chart 5.—Distribution of individual values of final rod threshold in horizontal meridian. The values given for each individual are the average of measurements at nineteen different locations.

PATHOLOGIC STUDIES

As a check on these clinical and laboratory studies we examined the autopsy material in 78 cases in which urinary calculi were present. Wolbach and Howe [12] have shown that in the albino rat and guinea pig the specific effect of a deficiency of vitamin A is the replacement of the various epithelial lined structures of the body by a stratified squamous keratinizing epithelium, and in almost every instance keratinization of the trachea and bronchi preceded that of the urinary tract. Wilson and DuBois [13] and Blackfan and Wolbach [14] showed that the same changes were encountered in infants dying of vitamin A deficiency, and the latter authors state that the commonest and earliest appearance of the keratinizing metaplasia is in the trachea and bronchi. These and other pathologic changes occurred in laboratory animals when urinary calculi resulted from vitamin A deficiency.

In none of our 78 autopsy cases was there any evidence of metaplasia in the bronchi or bronchioles. Dr. Richard H. Follis Jr. of the Department of Pathology has summarized the findings in the urinary tract as follows: "There are 3 cases of keratinizing squamous metaplasia, all of which are associated with marked inflammation.[15] This in itself can cause changes histologically indistinguishable from those produced by vitamin A deficiency. There are 3 instances of epithelial proliferation associated with pyelitis cystica or cystitis cystica which does not resemble the alterations following deprivation of vitamin A.[16] Furthermore it is not conceivable that vitamin A deficiency could be so widespread as is this type of metaplasia which is so frequently encountered in autopsy material. There is 1 case of squamous metaplasia of the ureter associated with inflammation.[17] This is an early change and yet shows none of the other early changes characteristic of vitamin A deficiency."

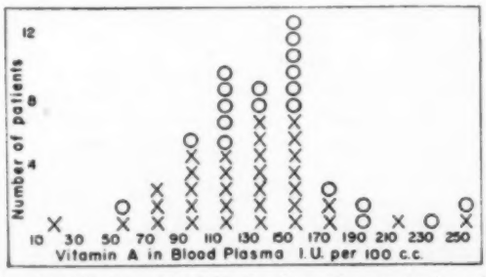

Chart 6.—Distribution of individual values of concentration of vitamin A in the blood plasma.

SUMMARY AND CONCLUSIONS

The rate of dark adaptation and the thresholds of the completely dark adapted eye were determined for 20 patients with urolithiasis and compared with 40 normal subjects. In addition the vitamin A content of the blood in these patients with urolithiasis was determined and compared with that of 33 normal controls.

In 78 autopsy cases with urolithiasis, the respiratory and urinary tracts have been examined for the epithelial metaplasia characteristic of vitamin A deficiency.

In none of these 98 cases was there any evidence of vitamin A deficiency.

Although a vitamin A free diet produces widespread epithelial changes which may lead to the formation of urinary calculi in experimental animals, as yet there is no positive proof that a "subclinical" vitamin A deficiency is an etiologic factor in urolithiasis in man.

1201 North Calvert Street.

ABSTRACTS OF DISCUSSION

DR. DAVID M. DAVIS, Philadelphia: Dr. Jewett and his co-workers have delivered a blow to the rather shaky foundations of the hypothesis that vitamin A deficiency is an important cause of stone formation. That hypothesis rested principally on the finding by other investigators that there was definite vitamin A deficiency in a series of stone cases. However, similar series of other kinds of diseases have also apparently shown vitamin A deficiency, particularly one series of noncalculous urinary tract disease and one series of certain skin diseases. The authors have largely nullified those findings by showing that under careful experimental investigations their series has shown no such vitamin A deficiency. What, then, is the relation, if any, of vitamin A deficiency to calculous or noncalculous disease of the urinary tract? One can only say that it still remains to be elucidated. Another member of this section, Dr. Prather, one time hypothesized that perhaps in these little animals, particularly rats, the incidence of stone formation might in some way be associated with obstructions caused in these tiny ureters by the proliferation of the epithelium that occurs in vitamin A deficiency. That is certainly a thought which would also tend to explain why it occurs in little animals and not in larger animals such as man.

DR. RUBIN FLOCKS, Iowa City: Following a discussion of the subject with Dr. Jewett I reviewed the material at the University Hospitals and found that there was no evidence of vitamin A deficiency as an associated factor in 100 patients with calcium urolithiasis. This tends to confirm the careful work of Dr. Jewett. He has proved conclusively that in patients with calcium urolithiasis there is no more vitamin A deficiency than in any comparable group of patients with some other disease. However, I wondered whether the problem had been completely cleared up in view of the fact that in most of the patients with stone in the urinary tract the picture that we see at the time we see the patient is an end result. It is not

12. Wolbach, S. B., and Howe, P. R.: Tissue Changes Following Deprivation of Fat Soluble A Vitamin, J. Exper. Med. **42**: 753-778 (Dec.) 1925.

13. Wilson, J. R., and DuBois, R. O.: A Report of a Fatal Case of Keratomalacia in an Infant with Postmortem Examination, Am. J. Dis. Child. **26**: 431-446 (Nov.) 1923.

14. Blackfan, K. D., and Wolbach, S. B.: Vitamin A Deficiency in Infants: A Clinical and Pathological Study, J. Pediat. **3**: 679-706 (Nov.) 1933.

15. Johns Hopkins Hospital General Pathology Nos. 16850, 15012 and 10094.

16. Johns Hopkins Hospital General Pathology Nos. 17343, 11826 and 8118.

17. Johns Hopkins Hospital General Pathology No. 10361.

the picture at the time when the stone is actually forming, and it may well be that, at the time the stone or nucleus started, one of the initiating factors was a vitamin A deficiency. This fits in with some of the experimental work done on animals. It fits in with the known rapid formation of small calculi in acutely ill, bedridden, vitamin deficient individuals. The further growth of these stones, however, has no relation to vitamin A deficiency, as Dr. Jewett and his co-workers have conclusively proved. Whether or not vitamin A deficiency is an important associated factor in the formation of the nucleus is, I believe, still a question which can be answered only by providing some means of demonstrating whether or not the patients are vitamin A deficient during the time of the formation of the nucleus. Certainly in light of this work such studies would be worth while.

DR. HUGH J. JEWETT, Baltimore: With regard to the suggestion of Dr. Flocks that perhaps vitamin A deficiency may be present in the beginning, I have this to say: That is purely hypothetical and I think the burden of proof rests on him. These patients with urolithiasis who show a pathologic adaptation when studied with the biophotometer actually may not have a vitamin A deficiency. I can't go into a detailed account of the biophotometer and the criticisms which are found in the literature with regard to it. It is essentially an instrument which fails to give constant results on the same individual day after day. In other words, lack of reproducibility in the results is one of the criticisms. All these patients who are suspected, after biophotometer tests or other tests, of having a vitamin A deficiency should have their blood levels checked for vitamin A.

A MECHANISM OF FATIGUE IN NEUROPSYCHIATRIC PATIENTS

A PRELIMINARY REPORT

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AND
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Fatigue is frequently observed in patients with neuropsychiatric complaints. The mechanism by which fatigue is produced has been little understood by either neuropsychiatrists or others. This preliminary report presents evidence suggesting one of the possible mechanisms and the animal experimentation on which the procedures adopted are based.

Spontaneous hypoglycemia has been noted by many investigators who have attempted to define the variety of settings in which it occurs. Previously Harris,[1] Ross and Josephs[2] and more recently Wauchope,[3] Conn, Wilder and others have reviewed the subject.

Blood sugar levels may fall following interference with many factors in the normal homeostatic mechanism. Liver disease and disease of the pancreas, either from known adenoma or from hyperplasia of the islands of Langerhans, have been cited as the important factors which may cause spontaneous hypoglycemia. Faulty dieting, including errors in intake of carbohydrates and the lack of assimilable vitamins, has also been a known factor. The pituitary-adrenal syndromes of the well known Simmonds' disease and Addison's disease have long been recognized as associated with hypoglycemic manifestations. Recently Rennie and Howard[4] presented a paper on hypoglycemia and tension depression. They studied neuropsychiatric cases and discovered, with their dextrose tolerance test by the oral route, the so-called flat curves and found, when these patients were recovering from their tension depressive symptoms, that the oral dextrose tolerance curve returned to near normal.

We were interested in this hypoglycemic state of the disease because of the so-called pernicious inertia which was the most prominent symptom of a patient who was referred to one of us by a neuropsychiatrist and a group of patients who were seen as a part of office consultation. We therefore undertook a study of the underlying metabolic processes, particularly as they affected their dextrose metabolism, to see whether we could not in some way determine the factors which produced the hypoglycemia.

EXPERIMENTAL EVIDENCE

Although there are a multiplicity of factors involved in the homeostatic mechanisms which maintain blood sugar levels, we shall discuss mainly those mechanisms associated with the insulin regulatory system.

The exact manner in which the secretion of insulin is controlled is as yet undetermined. Two main theories are propounded to explain this phenomenon: the neurogenic and the humeral. Unfortunately, neither explains all the various manifestations in their entirety. Proof must come from indirect determinations, since the quantity of insulin present in the blood stream is too low to be determined by chemical means or biologic assay.

Neurogenic.—That both myelinated and nonmyelinated nerve fibers supply the islands of Langerhans was demonstrated in 1902 by Gentes.[5] Further it was shown by McCrea[6] that these fibers are in communication with branches of the right vagus nerve.

Many workers have observed the effects of stimulation of the right vagus on the blood sugar level. Britton[7] reported a decrease in blood sugar following such stimulation. However, this occurred only when the pancreatic vein was intact but not when it was ligated. An increase in insulin secretion into the pancreatic duodenal vein was noted after vagal stimulation by Dietrich.[8]

A fundamental contribution was made by Clark,[9] who found that drugs which stimulate the parasympathetic nervous system produce a fall in the blood sugar level of intact rabbits; this effect did not occur following section of the vagus.

The foremost proponents of the vagal stimulation of the island cells have been La Barre and his asso-

From the Medical Department of the Michael Reese Hospital and the University of Illinois College of Medicine.

Read before the American Society for Research in Psychosomatic Problems, inaugural meeting, New York, Dec. 18, 1942.

1. Harris, Seale: Hyperinsulinism and Dysinsulinism, J. A. M. A. **83**: 729 (Sept. 6) 1924; Hyperinsulinism and Dysinsulinism (Insulogenic Hypoglycemia), Internat. Clin. **1**: 9 (March) 1932.
2. Ross, S. G., and Josephs, H. W.: Metabolism of Recurrent Vomiting, Am. J. Dis. Child. **28**: 447 (Oct.) 1924.
3. Wauchope, G. M.: Hypoglycemia: Critical Review, Quart. J. Med. **2**: 117 (Jan.) 1933.
4. Rennie, T. A. C., and Howard, J. E.: Hypoglycemia and Tension-Depression, Psychosom. Med. **4**: 273 (July) 1942.
5. Gentes, M.: Notes sur les terminaisons nerveuses d'ilots de Langerhans du pancréas, Compt. rend. Soc. de biol. **54**: 212, 1902.
6. McCrea, E. D.: The Abdominal Distribution of the Vagus, J. Anat. **59**: 18, 1924-1925.
7. Britton, S. W.: Studies on the Conditions of Activity in Endocrine Glands, Am. J. Physiol. **74**: 291 (Oct.) 1925.
8. Dietrich, S.: Untersuchungen über Diabetes und Insulinwirkung: XII. Mitteilung. Der direkte Nachweis der Insulin sekretion des Pancrease, Arch. f. exper. Path. u. Pharmakol. **125**: 336, 1927.
9. Clark, G. A.: The Influence of the Vagus on the Islets of Langerhans: Part I. Vagus Hypoglycemia, J. Physiol. **59**: 466 (March) 1925.

ciates. They reported that the normal dextrose level of a dog may be reduced by transfusion of blood from the pancreatic vein of another animal during stimulation of its right vagus nerve.[10]

Pursuing this problem further, these same investigators[11] seem to have established a relationship to a center in the thalamus which stimulates the pancreatic secretion of insulin when the blood sugar rises. The impulses are transmitted through the vagus tracts to the island tissue. They used 3 dogs with isolated circulatory and nervous systems. In this manner it was discovered that, although removal of the cerebral hemispheres did not prevent the hyperinsulinism resulting from the transfusion of hypoglycemic blood through the isolated head, the separation of the thalamus did abolish this hyperinsulinism. However, Gayet and Guillaumie[12] were unable to confirm these results.

Those who support the humoral control believe that the blood sugar level is the predominant factor in insulin secretion. This view is given support by the work of Phillips,[13] who did not find any effect on sugar tolerance after vagotomy, and by Long and Fry,[14] who claimed that glycogen resynthesis in muscle was not influenced by section of the vagi.

Houssay and his co-workers[15] have shown that the pancreas can produce its own internal secretion after all its extrinsic nerve supply has been removed and that the control of insulin secretion is directly dependent on the blood sugar level. Most workers seem to agree that the blood sugar level is the primary factor but that the neurogenic factor serves in emergencies.

Not much evidence substantiates the claim that the secretion of insulin is dependent on other hormones produced by the endocrine glands whose secretion in turn is controlled by the blood sugar level.

The presence of a "pancreatropic" factor in the pituitary gland is claimed by some, while others seem to believe that thyroid extract sensitizes the secretion of insulin.

A more comprehensive view has been taken by Soskin and his collaborators,[16] who believe that the output of insulin is relatively constant and that there is a homeostatic blood sugar regulating mechanism which depends primarily on the liver and which is controlled by the opposing influences of the pituitary, adrenal and pancreatic hormones.

With these experiments in mind and the fact that these psychoneurotic patients studied showed hypoglycemia as one of the important factors of their fatigue, we searched for further evidence as to the modus operandi that brought about this hypoglycemic factor in man. Psychiatric and medical literature is voluminous concerning the effect of emotional impulses on the somatic system. It is also well known that continued physiologic activity in any tissue may lead to either hypertrophy or hyperplasia, depending on the type of tissue involved.

Since the pancreas is an end organ and subject to vagal stimulation, we felt that it was logical to assume that the hypoglycemia of psychoneurotic patients was due to a long-continued stimulation of the right vagus nerve. This is based on the hypothesis that emotional processes occur somewhere in the higher integrated cortical centers and that the emotional impulses first go through the hypothalamus and are relayed to the autonomic nervous system, both sympathetic and parasympathetic systems being involved.

Those patients who are depressed would have a more constant stimulation by these emotional factors going through this pathway. It may even be possible that certain emotions influence definite pathways in the nervous system, localizing in the particular organs involved. Therefore this stimulation may lead to increased activity and irritability of the cells of the islands of Langerhans. This may be a temporary or a prolonged manifestation dependent on the degree and duration of the psychic and emotional impulses involved in the mechanism.

In order to establish the validity of this hypothetic conclusion, we studied 4 patients as a preliminary contribution. We first investigated the metabolism of these patients to rule out any other factors which could cause this hypoglycemic state. In none of these patients did clinical evidence of disease explain this manifestation. We then resorted to the intravenous dextrose tolerance test which had been established as a standard in the metabolic laboratories of the Michael Reese Hospital and previously reported by Soskin and his co-workers. We utilized the intravenous method because it gave use more definite scientific criteria as to what happens to the dextrose given to patients in order to study their tolerance. It removed the uncertainty of the variation of absorption which frequently leads to false interpretations when the oral method of dextrose tolerance is used for experimental observations.

Some of these patients showed on ⅓ Gm. of dextrose per kilogram of body weight, when given intravenously, a flat curve which had been previously interpreted as that seen commonly in hyperinsulinism. In order to substantiate the theory of vagus control in man we repeated the aforementioned experimentation after paralyzing the vagus with hypodermic injections of 1/75 grain (0.0009 Gm.) of atropine and found that the blood sugar curves which were previously flat returned to a near normal. A review of the literature concerning the effect of atropine on blood sugar is variable. Studies have not been conducted in patients or animals under the influence of atropine and with the use of the intravenous dextrose tolerance test. We wish to emphasize this statement because we do not think it is justifiable to draw conclusions from the results of the oral administration of dextrose as affected by drugs. One must always take into consideration the factor of the prolonged and variable absorption of dextrose in the gastrointestinal tract. Therefore we felt it justifiable to conclude that continued vagal stimulation in

10. La Barre, J.: Sur l'augmentation de la teneur en insuline du sang veineux pancréatique après excitation du nerf vague, Compt. rend. Soc. de biol. **96:** 193 (Jan. 28) 1927.

11. La Barre, J.: The Role of the Central Nervous System in the Control of Pancreatic Secretion: I. The Secretion of Insulin During Hypoglycemia, Am. J. Physiol. **94:** 13 (July) 1930.

12. Gayet, R., and Guillaumie, M.: Expériences concernant l'effet de l'excitation électrique du vague sur l'insulino-sécrétion, Compt. rend. Soc. de biol. **112:** 1197 (April 1) 1933.

13. Phillips, R. A.: The Influence of the Vagus Nerve on the Glycemic Level, Am. J. Physiol. **105:** 257 (Aug.) 1933.

14. Long, C. N. H., and Fry, Edith G.: The Effect of Vagotomy on Muscle Glycogen Resynthesis, Am. J. M. Sc. **185:** 884 (June) 1933.

15. Houssay, B. A.; Lewis, J. T., and Foglia, V. G.: La fonction endocrine du pancréas normal ou énervé pendant l'hypoglycémie insulinique, Compt. rend. Soc. de biol. **101:** 239 (May 24) 1929.

16. Soskin, Samuel; Allweiss, M. D., and Cohn, D. J.: Influence of the Pancreas and Liver on the Dextrose Tolerance Curve, Am. J. Physiol. **109:** 155 (July) 1934. Soskin, Samuel; Mirsky, I. A.; Zimmerman, L. M., and Heller, R. C.: Normal Dextrose Tolerance Curves, in the Absence of Insulin, in Hypophysectomized Depancreatized Dogs, Am. J. Physiol. **114:** 648 (Feb.) 1936.

the psychoneurotic patient was an important factor in producing functional hyperinsulinism and concomitant hypoglycemia.[17]

REPORT OF CASES

The following cases are presented to substantiate this evidence:

CASE 1.—L. M., aged 52, a professional man, complained of extreme fatigue and weakness following a common cold. Long after all signs of infection had subsided the malaise continued, and the patient was unable to carry on his usual professional duties. In his history there had been many periods of prolonged weakness associated with a tendency to perspire profusely. Long vacations were necessary, absenting him from his occupation. Exhaustive physical examination failed to reveal any organic explanation for this symptom complex. The blood pressure was 118 systolic and 76 diastolic. The basal metabolism was minus 3.5 per cent. Urine and stool analyses gave negative results. The blood count was within the limits of normal. Liver function tests gave negative results. The intravenous dextrose tolerance test, with ⅓ Gm. of dextrose per kilogram of body weight, gave the following results (chart 1): fasting 92, one-half hour after the intravenous administration 92, one hour 76, one and one-half hours 72, two hours 53. This test was repeated three weeks later, after hypodermic injection of 1/75 grain of atropine sulfate. Sufficient time was allowed for a good therapeutic effect of this drug before a fasting sample was withdrawn and the dextrose again injected intravenously. The following results are recorded: fasting (before atropine) 70, fasting (after atropine) 76, one-half hour after injection of dextrose 123, one hour 93, one and one-half hours 65, two hours 65.

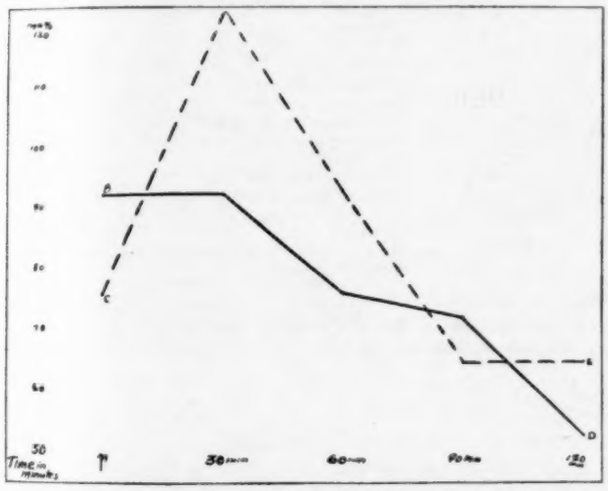

Chart 1 (case 1).—Intravenous dextrose tolerance test (*B*) before injection of atropine and (*C*) approximately thirty minutes after injection of 1/75 grain of atropine. *A*, fasting blood sugar levels in both tests; dextrose was then given. *D*, fatigue. *E*, no fatigue.

Follow-Up.—Since beginning his new regimen of divided feedings plus atropine, described later, he has been able to carry out his occupation well and feels clinically improved. At present he has submitted himself to a brief psychoanalytic treatment of his complaints, with therapy directed at those psychodynamic manifestations.

CASE 2.—Mrs. H. L., aged 46, a housewife, had a syndrome of headaches, epigastric distress and diarrhea, recurrent in nature for the past two years, after moderate exertion. There was definite weakness and fatigue following these attacks and asthenia and hunger on moderate exertion. On one occasion, while playing golf, she had a syncopal attack associated with profuse perspiration. Because she had received only transient relief from the psychiatric approach and was bedridden a great part of the time, her psychiatrist asked us to review her case for a possible organic source of her fatigue. She had a history of recurrent migraine which had subsided six years before, after a thorough psychoanalytic treatment. She had had an appendectomy twenty-six years before admission.

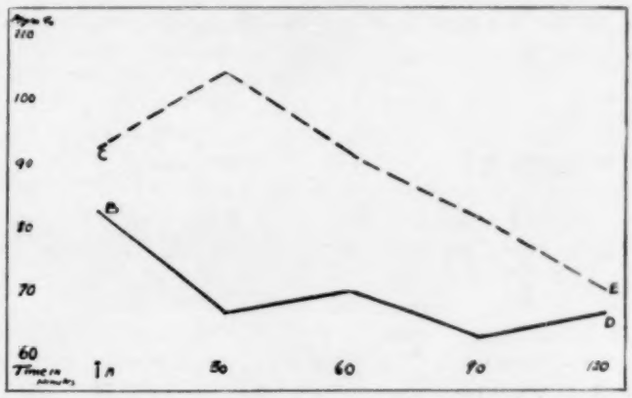

Chart 2 (case 2).—Intravenous dextrose tolerance test (*B*) before injection of atropine and (*C*) approximately thirty minutes after injection of 1/75 grain of atropine. *A*, fasting blood sugar in both tests; dextrose was then given. *D*, fatigue. *E*, no fatigue.

Physical examination was essentially negative. Blood pressure was 140/86. There was diffuse tenderness of the left half of the abdomen not associated with any palpable masses.

Intravenous pyelography and complete gastrointestinal studies were negative. Urine and stool analyses were negative. The basal metabolism was plus 6.1 per cent. Blood chemistry was normal. Blood agglutination tests for organisms of the various dysentery groups were negative, as were fresh and cultured stools for Endameba histolytica and other organisms causing diarrhea. The blood count was normal. Liver function was normal.

The intravenous dextrose tolerance test, with ⅓ Gm. per kilogram of body weight, was as follows: fasting 83, one-half hour after intravenous injection of dextrose 67, one hour 71, one and one-half hours 63, two hours 67. The next day, in order to see whether we could "shock" the dextrose regulating mechanism with a higher dose, we tried ⅔ Gm. per kilogram, and a typical posthyperglycemic-hypoglycemic curve was produced. The results were as follows: fasting 83, one-half hour after ⅔ Gm. per kilogram 158, one hour 102, one and one-half hours 40, two hours 40.

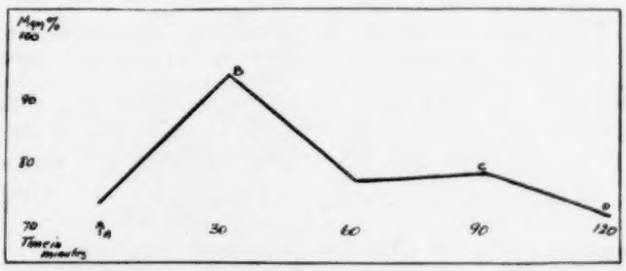

Chart 3 (case 3).—Intravenous dextrose tolerance test without atropine. *A*, fasting blood sugar—fatigue. *B*, no fatigue. *C*, moderate fatigue. *D*, more extreme fatigue.

The first test, e. g., ⅓ Gm., was repeated three weeks later, after injection of 1/75 grain of atropine sulfate hypodermically. The results were as follows: fasting (before atropine) 89,

17. The reader is referred to the following citations:

Danielopolu, D.; Stoicescu, S., and Cimino-Bérenger: Die Wirkung des Atropins auf die Glykämie beim Menschen, Klin. Wchnschr. **10:** 311 (Feb. 14) 1931.

Casanegra, A.: Influencia de las diferentes dosis de atropina sobre el metabolismo glúcido, Semana méd. **1:** 803 (March 10) 1932.

Wachholder, K.: Zur Frage der blutzuckersenkenden Wirkung des Insulins nach Vagotomie bzw. nach Atropin, Arch. f. exper. Path. u. Pharmakol. **175:** 62-66 (March 21) 1934.

Zagari and Pucci: Influenza dell'atropina sull'uroglycemia insulinia, Riv. di pat. sper. **3:** 161 (Feb. 15) 1935.

Hrubetz, M. C.: The Blood Sugar Level After Administration of Pilocarpine, Atropine and Acetylcholine, Am. J. Physiol. **114:** 551 (Feb.) 1936.

Hrubetz, M. C.: The Blood Sugar Level After Administration of Physostigmine and Atropine, ibid. **118:** 300 (Feb.) 1937.

Watanabe, F.: Ueber die Unterdrücking der Pilokarpinhyperglykämie durch das Atropin, Tohoku J. Exper. Med. **27:** 413 (Nov. 25) 1935.

Watanabe, F.: Ueber die hemmende Wirkung des Atropins auf die Peptonhyperglykämie, ibid. **27:** 416 (Nov. 25) 1935.

fasting (after atropine) 93, ⅓ Gm. per kilogram was given intravenously and then, in one-half hour, the blood sugar was 105, in one hour 92, in one and one-half hours 82, in two hours 71 (chart 2).

The patient has now been on the therapeutic regimen here outlined for two months. She has done remarkably well and is able to engage in her social activities and attend her numerous

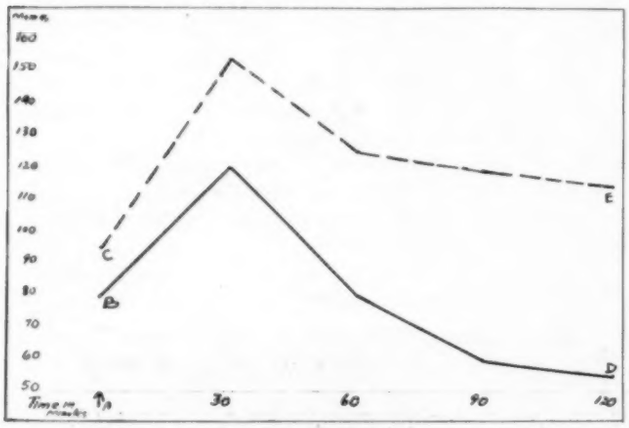

Fig. 4 (case 4).—Intravenous dextrose tolerance test (*B*) before injection of atropine and (*C*) approximately thirty minutes after injection of 1/75 grain of atropine. *A*, fasting blood sugar in both tests; dextrose was then given. *D*, fatigue. *E*, no fatigue.

civic organizations. She sleeps eight to ten hours each night without sedation and has a normally functioning gastrointestinal tract.

CASE 3.—Mrs. H. S., aged 44, gave a long history of weakness, "shaking sensations," profuse perspiration and protracted diarrhea. These symptoms would come mainly when she was under emotional strain. She quite accidentally discovered that taking sugar would alleviate these symptoms to some extent. Thorough physical, laboratory and roentgenologic examinations failed to reveal any significant findings. The liver function tests were negative. The intravenous dextrose tolerance test, with ⅓ Gm. per kilogram of body weight, was as follows: fasting 73, one-half hour 93, one hour 76, one and one-half hours 78, two hours 71. We were not able to repeat this test after the injection of atropine but exhibit this case to illustrate the tendency to a "flat type of curve." The patient had to leave the city immediately after the first test because of her work in the American Women's Voluntary Services. We therefore put her on the medical and therapeutic regimen described and she has been on this plan for three weeks. She puts in from ten to twelve hours a day. She does not fatigue. She has no diarrhea. The "shaking sensations" have entirely disappeared and she reported by letter that she has not felt as well in the past fifteen years as she has in the last six weeks (chart 3).

CASE 4.—Mr. Y., aged 43, a machinist, gave a bizarre history of recurrent attacks of tachycardia and palpitation with associated weakness of the legs. These attacks arose suddenly, would last for a few hours and were accompanied by profuse sweating and faintness. They became so severe that he was unable to continue with his occupation and remained at bed rest a great deal of the time.

He had had an appendectomy three years previously.

Physical examination was essentially negative. The blood pressure was 130/70. There was a moderate tachycardia. The electrocardiogram was normal. Urine and stool analyses were negative. Complete gastrointestinal roentgenograms were negative. A blood count was normal.

One-third Gm. of dextrose was injected intravenously with the following results: fasting 80, one-half hour 120, one hour 80, one and one-half hours 60, two hours 56.

Although this was not a typical "flat" curve, it did present a good hypoglycemic effect. It is of interest to note that his weakness was improved about one-half hour after the first tolerance test but was definitely worse at the end of two hours.

Following the injection of atropine, the dextrose tolerating curve was as follows: fasting (before atropine) 100, fasting (after atropine) 95, one-half hour 154, one hour 125, one and one-half hours 118, two hours 114. In this instance there was no associated weakness at the end of the test (chart 4). The patient has been on the therapeutic regimen for four weeks. He has gained somewhat in weight. His tachycardia, palpitation and weakness have almost completely disappeared and he gets a slight recurrence only when he suffers from a severe emotional upset and, since he has been reassured of the lack of serious aspect of this picture, he has reported that he has for the first time a sense of well-being.

Having made these observations, the next step was to develop a therapeutic approach to the problem of continued hypoglycemia. In order that not too readily absorbable carbohydrates in the form of simple sugars be given to the patients, the accompanying diet was outlined:

It will be seen that this is essentially a high protein, moderately high fat and relatively high carbohydrate diet, but the carbohydrates are in the more complex form and take a more prolonged period for their complete digestion. This was based on twofold evidence: first, that the injection of dextrose in normal dogs at a slow rate greatly increases the tolerance of these animals to subsequent, more rapid injection,[18] and, second, the deaminization of protein and the formation of carbohydrate goes on at a much slower rate in the liver and therefore the liver will give a more prolonged

Outline of Diet

Foods Allowed

Cereals	All cooked and dry; macaroni, spaghetti, noodles and rice
Bread	*Enriched white; *whole wheat; crackers, and Melba toast. (* Include daily in diet)
Soup	Vegetable milk soups
Meat	Lean meat and fowl
Fish	Lean fish, shrimp and oysters
Eggs	Two daily, poached and boiled
Cheese	Small portions
Vegetables	All cooked and raw
Fruits	Fresh, stewed and canned
Beverages	Milk, buttermilk, fruit juices, tea, coffee and cream
Dessert	Fruit gelatin, simple puddings and sponge cake
Butter	Specified amounts

Foods to Avoid

Very fat meat or fish, oils, pastries, fried foods and pure sugar
In case of diarrhea, omit raw fruits and vegetables, onions, cabbage, corn, dried peas and beans

Diet Order

Protein	141 Gm.
Fat	127 Gm.
Carbohydrate	253 Gm.
Calories	2,719

Menu

Breakfast	Dinner	Supper
Orange juice, 6 oz.	Cream of vegetable soup, 4 oz.	Oyster cocktail
Cream, 3 oz.	Broiled lake trout, 5 oz.	Broiled steak, 5 oz.
Oatmeal	Steamed rice	Double baked potato
Butter, 1 pat	Tomato salad	Fresh broccoli
Bread, 2 slices	Lemon and oil dressing, 1 teaspoon	Head lettuce
Eggs, 2	Bread, 2 slices	Lemon and oil dressing, 1 teaspoon
Coffee	Butter, 1 pat	Bread, 2 slices
	Fresh applesauce	Butter, 1 pat
	Sponge cake	Fresh fruit cup
	Milk, 6 oz.	Tea with lemon

No sugar

10 a. m.—Milk, 6 oz.
3 p. m.—Orange or grapefruit juice (fresh), 6 oz.
8 p.m.—Milk, 6 oz.

Note: If the amount is not indicated in ounces or measurements, consider average portion.

18. Jordan, E. M.: The Effect of Injected Glucose on Tolerance, Am. J. Physiol. **80:** 441 (April) 1927.

secretion of dextrose over a longer period of time, and the postdigestive hypoglycemia in these patients will be delayed if necessary to the next intake of food. However, we felt that more frequent feedings than the normal three meals a day was an additional factor of safety to prevent hypoglycemia from becoming manifested in these patients.

In addition, we thought it was clinically indicated from the experimental evidence accumulated that the vagal nerve would be in a state of partial paralysis with the addition of physiologic doses of atropine, 1/200 grain (0.0003 Gm.) three times a day by mouth, to the regimen, and finally, in order to assure more complete utilization of dextrose in their muscle metabolism, small doses of thiamine hydrochloride were also given three times a day.

RESULTS OF THIS MANAGEMENT

The striking and rapid disappearance of the so-called pernicious inertia made a profound impression on us in the clinical course of these patients. When these patients had been more or less bedridden previously, we found that they were able to assume their normal routine type of living quickly. The fatigue disappeared. One patient who had diarrhea, which may be a symptom of hypoglycemia or vagotonia, had normal bowel movements without any other attempt at gastrointestinal control either dietary or medicinal. Although there are too few cases from which to draw any general conclusions, our main reason in reporting the evidence is to stimulate repetition by those who may have an opportunity from their clinical material to study these manifestations in their patients. Furthermore, it may be mentioned incidentally that the psychoneurotic symptoms of these patients were reported to their neuropsychiatrists as definitely improved.

CONCLUSIONS

1. Fatigue may be a prominent symptom of neuropsychiatric complaints.

2. There is experimental and clinical evidence to show that a possible mechanism is hyperinsulinism.

3. This hyperinsulinism may be the result of temporary or prolonged stimulation of the right vagus nerve resulting from emotional processes being relayed through the hypothalamus to the autonomic nervous system.

4. The injection of atropine prevents this stimulation and allows the blood sugar curves to return to near normal.

5. Definite clinical improvement has been noted in the few cases thus far studied.

104 South Michigan Avenue.

The Stomach of Birds.—The Biological Survey division of the Department of Agriculture has been our chief source of authentic information regarding the food of birds. They have examined the stomachs of over 112,000 birds, including practically every species found in this country. They marshal imposing figures not only as to the type but as to the quantity of larvae, worms, insects, scale lice, weed seed and other noxious substances eaten by birds. It is estimated, for instance, that in one state (Iowa) the tree sparrows (not English sparrows) alone eat approximately 875 tons of weed seed in one year! Nearly 10 tons every day of summer! They have presented convincing figures of the same sort regarding birds which destroy the boll weevil, the chinch bug and the Japanese beetle. —Menninger, William C.: Bird Study, *Bull. Menninger Clin.* **6**:94 (May) 1942.

THE FEMALE OBSTRUCTING PROSTATE

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AND
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John Caulk [1] in 1921, in a paper entitled "Contracture of the Vesical Neck in the Female," as far as we have been able to find, is the first to suggest resection for bladder neck obstruction in the female. In that paper only 1 case was reported. In 1935 he [2] again called attention to the subject.

In 1933 Nesbit [3] reported 2 cases of bladder neck obstruction which he cured by resection.

In 1934 Fite [4] reported 1 case in which resection accomplished a brilliant cure.

Caulk [5] in 1937 reported a total of 15 cases coming under this classification. Twelve of these were due

Fig. 1.—Cross section of posterior part of female urethra showing a rich prostatic gland.

to inflammatory contractures, 1 the result of lobulations at the orifice cystoscopically similar to prostatic lobes, 1 the result of a subtrigonal hypertrophy and the other a large papillary mass.

The Dutch urologist Van Houtum,[6] in an article titled "Prostatism in General and in the Female," reported 2 instances, 1 in a woman aged 41 and 1 in a woman aged 27.

In 1931 Folsom [7] first emphasized the clinical importance of the group of glands surrounding the posterior

From the Department of Urology, Baylor University Medical College.
Because of lack of space this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.
Read before the Section on Urology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

1. Caulk, J. R.: J. Urol. **6**: 341-343 (Nov.) 1921.
2. Caulk, J. R., and Patton: J. Urol. **33**: 504-512 (Feb.) 1935.
3. Nesbit, R. M.: Urol. & Cutan. Rev. **37**: 291-293 (May) 1933.
4. Fite, E. H.: Urol. & Cutan. Rev. **38**: 163-165 (March) 1934.
5. Caulk, J. R.: Internat. Clin. **4**: 136-148 (Dec.) 1937.
6. Van Houtum, I.: Geneesk. bl. u. klin. en lab. v. d. prakt. **37**: 155-185, 1939.
7. Folsom, A. I.: The Female Urethra, J. A. M. A. **97**: 1345-1350 (Nov. 7) 1931.

part of the female urethra. He felt then, and we feel now, that an infection harbored through the years in these glands is probably the cause of the bizarre pathologic picture seen in this portion of the female urethra (figs. 1, 2, 3, 4 and 5).

Fig. 2.—Female periurethral prostatic glandular supply.

From our observations of this interesting and important lesion we are convinced that prostatism is a clinical entity that is seen much more frequently in women than is recognized and properly treated. Physicians

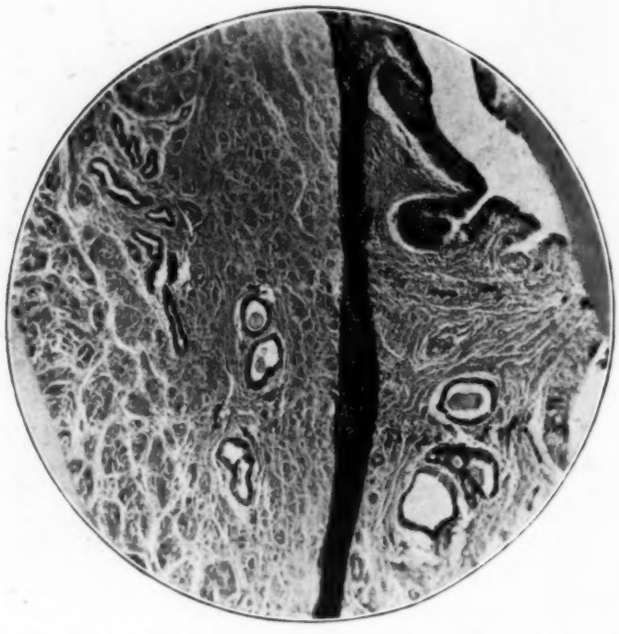

Fig. 3.—High power view of figure 2 showing prostatic glands with retained secretion.

have so long had their minds closed to the female prostate as nonexistent that they often fail to ask the proper questions to get an accurate and revealing history. Yet, it is our firm conviction that many women who have some type of prostatism are going without proper treatment because physicians have not fully realized that such conditions do exist and do cause all the clinical symptoms that are seen in similar conditions in men.

Clinically these cases present, in addition to a bladder irritation, some degree of difficulty in voiding. This is varied in our series of cases from simply a sense of obstruction and unfinished business on through varying degrees of obstruction to complete retention. Three out of 15 of our cases have shown this final stage of obstruction, viz. retention. The urine in these cases may show nothing of importance or, on the other hand, be heavily loaded with pus.

In 4 of our cases the bladder urine showed 4 + pus or more, while the urines collected from the right and left kidneys showed no pus and no organisms. In each of these cases the bladder mucosa was not inflamed. Therefore we feel that these cases represent a similar

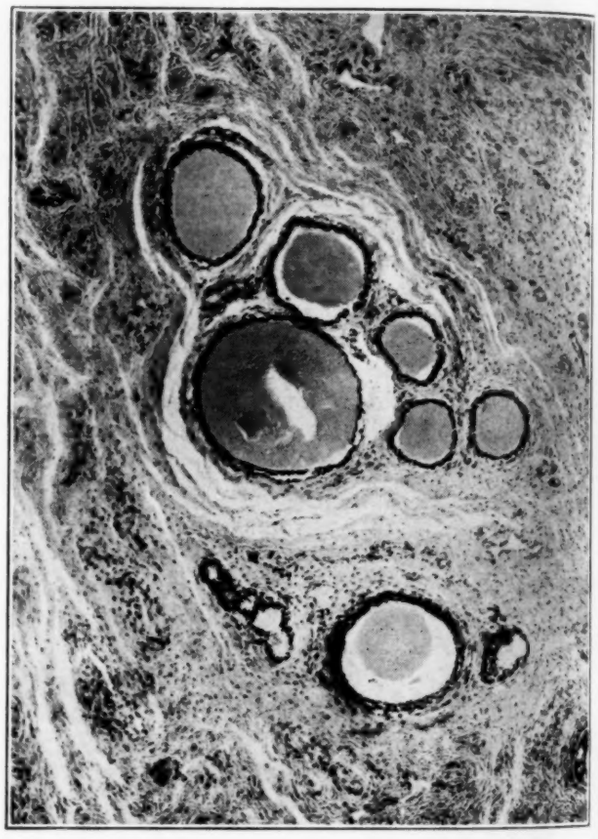

Fig. 4.—High power view of another group of female prostatic glands with retained secretion.

group in the male, in which the pus originates in the posterior part of the urethra from the prostate and seeps back into the bladder through the relatively weak internal vesical sphincter.

A plain cystogram, either air or sodium iodide being used, will frequently reveal a filling defect in the region of the internal orifice similar to the defects seen in men in prostatic hypertrophy (figs. 6, 7 and 8).

On cystoscopic examination one may find a normal bladder wall or a grossly trabeculated wall with cellules and even diverticula and calculi. The best observation of the bladder neck in our opinion is made by using both the close vision cystourethroscope and the panendoscope. At times we have found the retrograde lens of great value in evaluating a collaret type of enlargement such as seen in figure 11. Not infrequently the bar or collaret may be felt by palpating the urethra through the vagina with the cystoscopic sheath in place.

The majority of the cases that we have seen as well as those reported in the literature show a fibromuscular hypertrophy (fig. 9) with fibrous hyperplasia and varying grades of inflammatory reaction. In some cases actual gland structures have been reported, and these seem to be identical with similar lesions in the male.

We have for years considered these cases in the male as an end result of an old chronic prostatitis of varying degrees of severity and showing a variety of type of reaction; and, since we now have ample pathologic evidence that there is a group of glands surrounding the posterior part of the female urethra, which Caldwell [8] goes so far as to identify as strictly a homologue of the prostate in the male, we may with propriety assume that the two pathologic entities are in fact identical.

Therefore we feel that the most plausible explanation for the pathologic lesion we are discussing is, first, the existence of a homologous group of glands surrounding

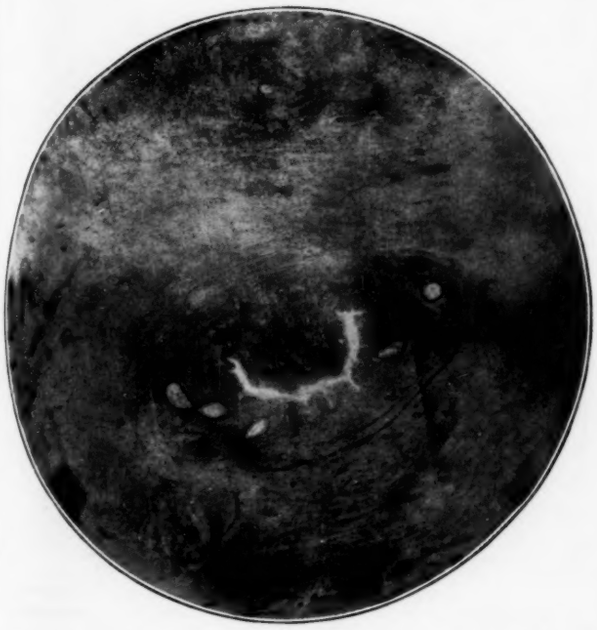

Fig. 5.—Cross section of posterior part of urethra of full term fetus with prostatic gland structures.

the posterior part of the female urethra and, second, that these glands do become infected and that after harboring this infection for months or years these bars, collarets and cicatrical contractions are produced.

Dr. Hargrove of Baton Rouge, La., supplied figures 10 and 12. This tissue was removed transvesically by a rectoscope loop from a nodular mass filling the posterior part of the urethra in a woman and producing a complete obstruction. We think any one would agree that this is really and truly an adenomatous enlargement of the female prostate. So that, while the majority of the cases are inflammatory in character, yet we can and do see frank adenomatous overgrowth.

These lesions lend themselves very readily to transurethral resection. The results are as satisfactory as they are in the male. We should therefore recognize this as a gross clinical entity and begin to offer to these patients the great relief we have for years been affording the male who is similarly affected.

8. Caldwell, G. T.: Texas State J. Med. **38**: 627-632 (Jan.) 1941.

In discussing transurethral resection in the female one must readily realize that we have to be much more careful in our technic: first, for the simple reason that, since we are dealing with miniature prostates we must be more sparing in our bites of tissue removed to insure

Fig. 6.—Opaque cystogram in woman with retention. The prostate can be clearly seen as a defect in the lower margin of the bladder shadow. Also cellules, diverticula and ureteral regurgitation.

against cutting through the urethrovaginal septum; second, for the reason that we do not, as far as we have observed, have a capsule that may be seen during resection and hence act as a guide; third, because excessive fulguration may be as bad as too deep a

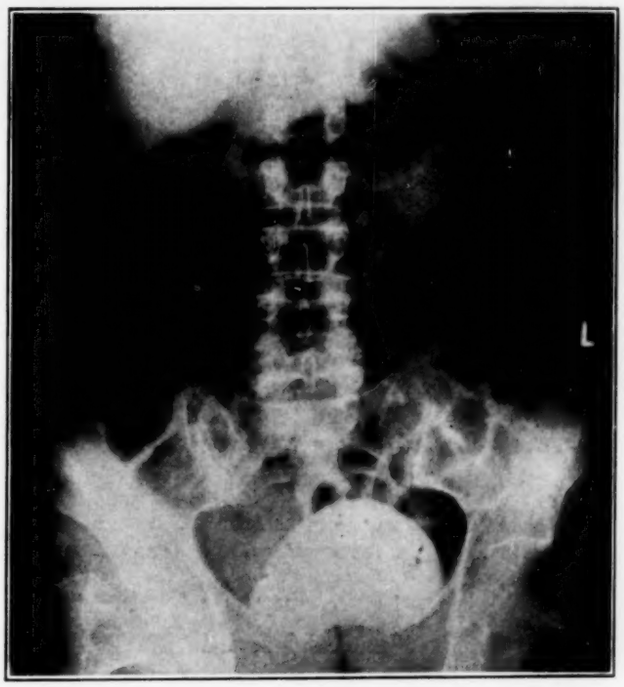

Fig. 7.—Opaque cystogram of woman showing filling defect characteristic of small prostatic enlargement.

cut. This accident happened to us in 1 of our cases and on the ninth postoperative day led to the formation of a urethrovaginal fistula, which was later repaired. We therefore use as little fulguration as possible, relying on the Foley bag and traction to control the bleeding.

In 5 of our cases the resection was limited to the lower segment of the urethral circumference, since we were in these cases dealing with a bar.

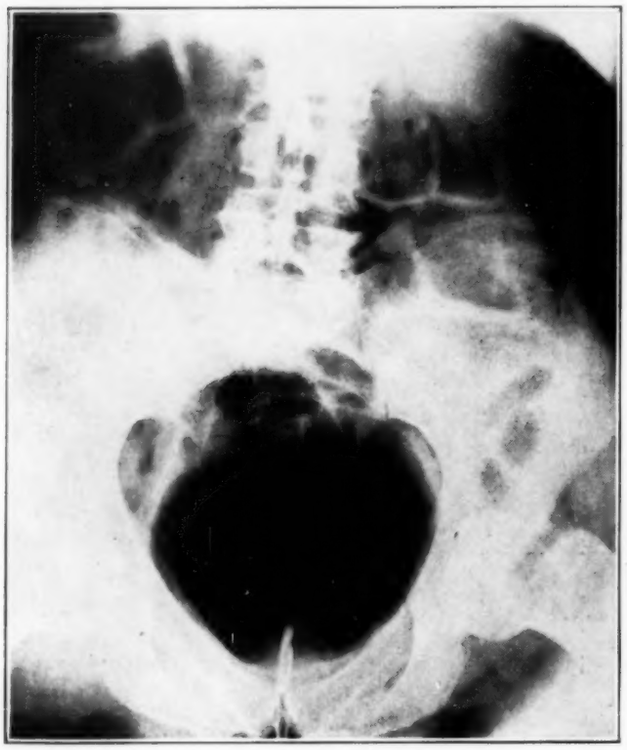

Fig. 8.—Air cystogram in female showing filling defect characteristic of enlarged prostate

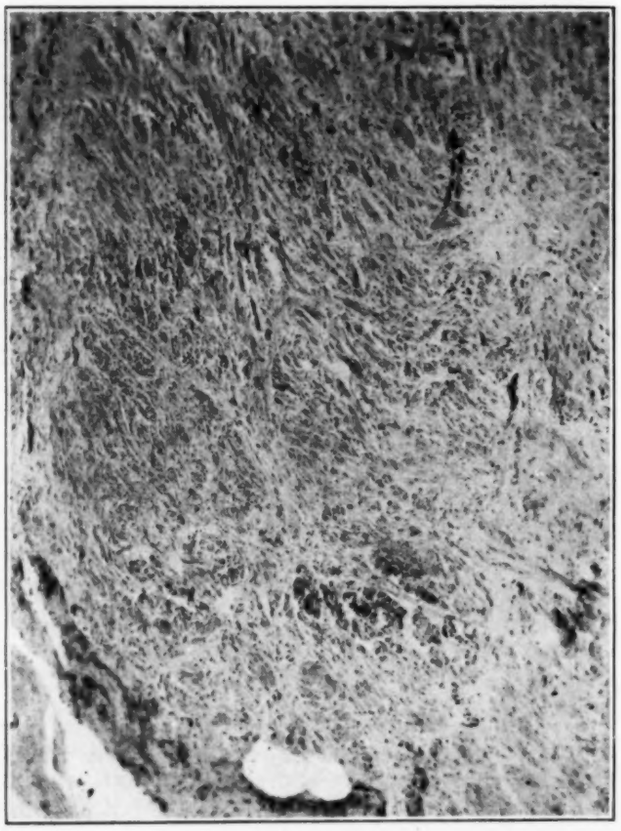

Fig. 9.—Section of tissue removed at resection showing the typical fibromuscular hypertrophy with fibrous hyperplasia.

In 9 cases the entire circumference of the urethra was resected. It was necessary to resect the upper segment in 1 of these cases, in which no result was obtained after the first resection, which was limited to the lower segment.

Only one death occurred following resection in this series of cases and that of a woman aged 67 with rather severe diabetes who had myocardial damage resulting from a previous coronary occlusion. She had complete retention, with blood urea 50.9 mg. She died from cerebral hemorrhage.

After this somewhat cursory discussion of the female obstructing prostate we will report 3 of our cases in some detail, leaving the remaining case histories to be published in detail at the end of the paper.

Hallie B., a Negro woman aged 50, came to the outpatient department of Parkland Hospital complaining of having had gradually increasing bladder trouble for the past five years characterized by frequency, burning and difficulty in voiding. This difficulty had grown gradually worse in recent months until she had complete retention of urine. At the time of admission she was unable to void and, when she was catheterized, 12 ounces (355 cc.) of urine was removed. A plain film

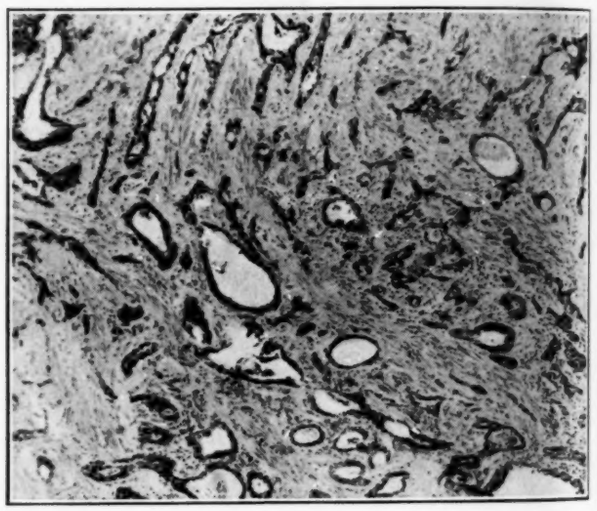

Fig. 10.—Section in Dr. Hargrove's case of actual adenomatous hypertrophy of the female prostate gland.

of the kidney, ureter and bladder tract was negative; a cystogram showed a definite filling defect characteristic of mild prostatic hypertrophy (fig. 13). Cystoscopy showed a bladder wall grossly trabeculated with some evidences of a recent acute inflammation. Observation of the bladder neck disclosed a perfectly typical bilateral intraurethral enlargement (fig. 14) with a very acute angle at 12 o'clock and two lateral masses protruding into the lumen of the urethra; these masses were separated from each other at 6 o'clock by a small amount of intervening tissue which did not seem to be hypertrophic.

A transurethral resection was done, at which time approximately 12 Gm. of tissue was removed (fig. 15). No unusual difficulties were encountered. A catheter bag was left in place. The patient made a very uneventful convalescence. On the fourth day the catheter was removed. She had complete incontinence for a few weeks and then began to regain control and in three months was entirely continent and has remained so. She feels well and voids her urine normally in every way. She has no retention.

Mrs. H., aged 67, also seen at Parkland Hospital, was first seen for bladder irritation and difficulty in voiding, which had resulted in retention. The urine was grossly infected.

Cystoscopy showed a collaret type of enlargement completely surrounding the internal urethral orifice. The bladder was grossly trabeculated. After preliminary drainage, resection was done. Several bites of tissue were removed from 3 o'clock

through 6 to 9 o'clock. A bag catheter was left in place. Convalescence was very good, and on the fifth day the bag was removed. She still was unable to void any urine; the catheter had to be replaced, and during the next three weeks she had fever and there were large amounts of pus in the urine. At intervals the tube was removed in the hope that her inability to void was due to an edema, but at no time could she void.

Fig. 11.—Cadaver specimen of female bladder opened from above, showing internal vesical orifice surrounded by collaret type of prostatic enlargement.

Cystoscopy was done again. The resected area was healed nicely, but the remaining upper half of the collaret was even more prominent than on previous cystoscopy. Resection was done again, at which time the upper half of the collaret was removed. When this was done it was found that some more tissue had to be removed at the site of the first resection. At this sitting nearly 6 Gm. of tissue was removed. Her convalescence was satisfactory, and after removal of the catheter on the fourth day she could void freely but had a minor degree of incontinence, which lasted only a short time. When last seen, six weeks after final operation, she was voiding satisfactorily and her general health had improved. She had perfect control and no residual urine.

Mrs. H., a white woman aged 67, had begun to have frequency, burning and difficulty seven years before. This increased gradually until four years later she was unable to void any urine at all. She was seen in one of the large clinics and after careful examination was told that she had paralysis of the nerve of the bladder. This diagnosis was made in spite of the fact that her neurologic findings were normal and her spinal fluid examination was negative. She was told that she would have to learn to catheterize herself and thus empty and wash out her bladder twice daily, for nothing could be done to get her well. She went home and carried out this regimen for the following three years, when she began to feel bad in a general way, being nauseated, very weak and having headaches.

At this point we saw her. She gave us the immediate impression of being seriously ill. A plain film of the kidney, ureter and bladder tract showed three stones apparently located in the bladder. Her urine was foul, with a terrible odor.

Cystoscopy showed a fiery red bladder over its entire area. It was grossly trabeculated and cellulated and in the dome showed one wide mouthed diverticulum. The three stones could be seen plainly, one part of one being in a cellule. The ureteral openings could not be identified, and no indigocarmine appeared over a period of twenty to thirty minutes. Efforts to catheterize the ureters were made even though they could not be seen, but with no success. On observing the internal vesical orifice we could see a very pronounced bar, which we thought was the cause of the obstruction. Excretory urograms showed nothing.

When the patient entered the hospital catheter drainage was instituted and dextrose and saline solution were given intravenously, but in spite of these measures she rather rapidly grew worse with the blood urea going from 121 to 178 mg. She died on the fifth hospital day in a typical uremic convulsion.

An autopsy showed massive bilateral hydronephrosis and hydroureter as seen in figure 16. The bladder, opened from above, showed the stones, trabeculae, the diverticulum and the transverse bar at the internal vesical orifice. Figure 17 shows a larger view of the bladder. The prostatic bar can be seen plainly at the internal urethral orifice.

We feel reasonably sure that if this woman had been recognized as having prostatism when first seen and proper measures had been taken, such as a transurethral resection, she would have had a good result and her upper urinary tract would have restored itself to a reasonably normal status.

CASE HISTORIES

CASE I.—Mrs. T. V. F., white, aged 42, was complaining of frequency, dysuria, nocturia and slowness of the stream. These symptoms had been present for about ten years and had appeared following radium implantation for the treatment of carcinoma of the cervix. During the five months prior to examination all these symptoms had been definitely increased in severity.

Examination showed the presence of a stricture of the urethra and a chronic granular urethritis with thickening and elevation of the posterior lip of the internal orifice.

Fig. 12.—High power view of figure 10.

A transurethral resection of the thickened posterior lip was carried out with a McCarthy resectoscope under sacral anesthesia. A two way catheter was left in the bladder for constant irrigation the first forty-eight hours. The postoperative course was entirely uneventful.

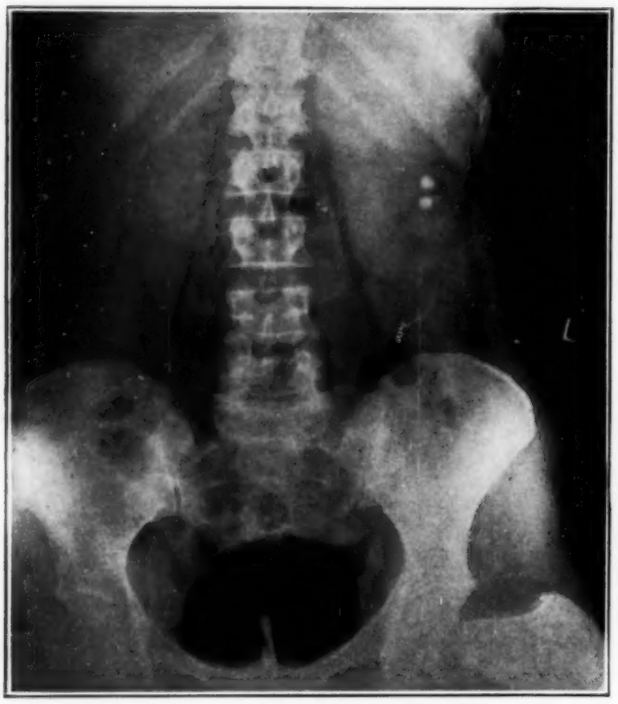

Fig. 13.—Air cystogram in case H. B. showing rather pronounced filling defect in region of prostate.

The pathologic diagnosis was muscular hypertrophy of the prostate.

One month after the resection the patient was entirely free from all urinary distress, although she still had to get up once at night to void.

Fig. 14.—Drawing by Lewis Waters showing bilateral type of enlargement of prostate in case H. B. Panendoscopic view.

CASE 2.—Mrs. J. W. S., white, aged 60, complained chiefly of difficulty in passing urine. She first noticed this trouble two years prior to examination and stated that the difficulty in starting her stream was definitely increasing in degree. During the six weeks prior to examination she had had complete retention on two occasions requiring catheterization. During the two years that her symptoms had been present she had received some relief from dilations of the urethra; however, as soon as these treatments were stopped the difficulty in starting the stream recurred.

Her general physical findings were normal.

Examination of the urethra showed a persisting stricture, so that a number 24 F. cystoscope was held rather tightly in spite of the history of frequent urethral dilations during the past two years. There was pronounced thickening of the posterior lip of the urethral orifice. The ureteral orifices were normal in appearance and the bladder surface appeared quite normal. There were a few pus cells noted in the catheterized specimen.

Preoperative determination of the urea showed 25 mg. per hundred cubic centimeters of blood.

Under sacral anesthesia a transurethral resection of the obstructing tissue of the internal urethral orifice was performed with the McCarthy resectoscope. Six pieces of tissue were taken, starting at 3 o'clock going through 6 o'clock and around to 9 o'clock.

Postoperative convalescence was uneventful, and the patient got an excellent immediate and late postoperative result.

Fig. 15.—Tissue removed from H. B. shown in figures 13 and 14.

CASE 3.—Mrs. J. L. H., white, aged 72, first seen in April 1937, complained of difficulty in passing urine, a frequency of thirty minutes to an hour during the day and six to eight times at night, urgency and suprapubic pain.

Examination showed a definite stricture of the urethra so that a number 16 cystourethroscope had to be used for the examination. In addition there was observed a pronounced chronic granular urethritis. In spite of regular urethral dilations the patient obtained only partial symptomatic relief. Repeated determinations of residual urine showed from 1 to 3 ounces (30 to 90 cc.) on each occasion.

On Sept. 26, 1937 the patient developed a complete retention and was admitted to Baylor Hospital, where examination was carried out under general anesthesia. The stricture had been dilated so that a number 24 cystoscope could easily be introduced. We observed a thickened bar of tissue across the floor of the internal orifice, and it was decided to resect this since there was no other explanation for the complete retention.

With a McCarthy resectoscope only four pieces of tissue were removed from this thickened bar, and a two way catheter was left in for continued drainage of the bladder.

Convalescence was stormy. During the next three days there was an elevation of temperature to 103.5 F. on each

day. Following this, however, the temperature gradually subsided to normal; and the patient was discharged from the hospital on the tenth postoperative day. At that time she was able to void freely and had no trouble with urinary control.

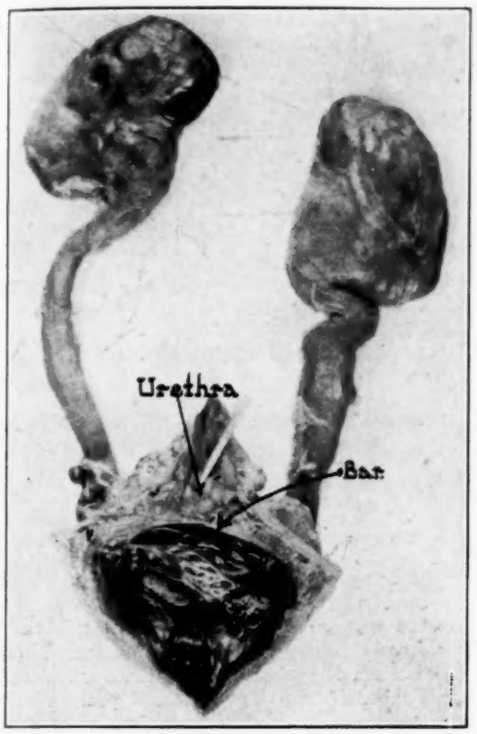

Fig. 16.—Autopsy specimen of Mrs. H. showing bilateral hydronephrosis and hydroureter, with trabeculated bladder wall, one diverticulum, two bladder stones and a prostatic bar, the cause of the entire pathologic picture.

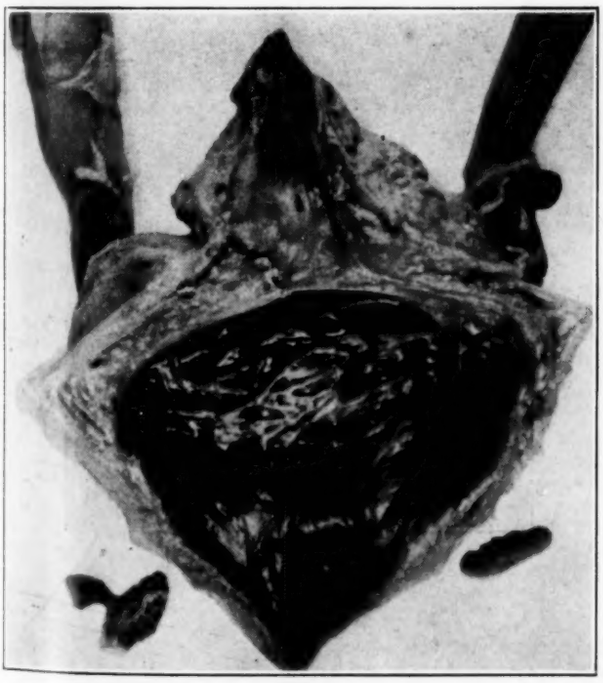

Fig. 17.—A closer view of the opened bladder and urethra, showing diverticulum, trabeculae, stones and prostatic bar.

The late result has been satisfactory, although the patient still voids one to two times at night, and the catheter urine continued to show about grade 1 of pus in the centrifuged sediment.

The pathologic diagnosis of the tissue removed was chronic inflammation of the urethral mucosa.

Case 4.—Miss L. K., white, aged 25, complained of frequency of urination, nocturia and dysuria. These symptoms had been present for a year in spite of the fact that the patient had been receiving all types of local treatment to the urethra during this time.

At the time of our first examination she was complaining of spasmodic-like pain in the urethra and bladder that would occur at frequent intervals and would cause her to void every few minutes. These attacks would last for an hour or two and then she would suddenly get relief. During these attacks she was never able to void more than a few drops of urine, although after the spasm passed she could then completely empty her bladder.

On examination we found the urethra of normal caliber and the urethral mucosa showing only a slight congestion in the posterior portion. There was a thickening of the tissues of the internal urethral orifice involving the entire circumference. The bladder was normal on inspection of the interior, and the upper urinary tract was normal.

Under general anesthesia transurethral resection of the fibrous tissue from the internal urethral orifice was carried out, tissue from the entire circumference being removed in the amount of 3 Gm.

The pathologic diagnosis was chronic urethritis with epithelial hyperplasia.

A catheter was left in for two days following the resection. The patient left the hospital on the fifth day. She obtained an excellent immediate postoperative result. She was last examined one year following her resection and had been very comfortable, although at the time she had mild spells of dysuria that would last for a day or two.

ABSTRACT OF DISCUSSION

Dr. Nelse F. Ockerblad, Kansas City, Mo.: I have never seen a case of "female prostate," obstructing or otherwise. This paper of Folsom and O'Brien does excite my interest. I have sometime had this experience: The wife of one of my patients, whom I had resected for prostatic obstruction, has come to me somewhat timidly and secretively to suggest that she thought that she needed the same sort of an operation as she was having the same symptoms and her "prostate" was undoubtedly at the bottom of the trouble. Residual urine in the female is not particularly rare and is generally due to one of two causes: (1) neurogenic bladder of whatever type and (2) stricture of the urethra. The female urethra is a subject concerning which the authors know a great deal. It has been my experience in dealing with women who complain of trouble in the urethra that in fully one half the less you do for them the quicker they will get well.

Dr. Reed Nesbit, Ann Arbor, Mich.: Just eleven years ago in this section Dr. Folsom discussed this same problem and called our attention to the subject. He said that many women have difficulty at the vesical outlet and few have real obstructive lesions there. It is important to realize that in all of the cases reported, not only by Folsom but by others, in which relief has been brought about by transurethral resection, there have been three definite objective findings which have been of value in diagnosis: First of all there has been residual urine; second, there has been trabeculation of the bladder; and, third, there has been a palpable lesion which could be seen with a cystoscope or a urethroscope. During the past year I have seen 2 women who might fall into this category. They had difficulty with urination. One of them had complete retention of the urine requiring catheterization. Neurologic examination was negative in both of these cases. In both there was residual urine. There was a moderate degree of trabeculation, and on pantoscopic examination a visible bar was present which was not palpable by vaginal examination on the instrument. In these 2 cases we suspected that there might have been a neurogenic contraction of the vesical outlet or the internal sphincter. A procedure was utilized in order to differentiate this point. I believe Alec Hepler first suggested it. A local anesthetic agent was injected

into the lumbar sympathetic, after the manner described by Alton Ochsner for the treatment of inflammation of the vein from phlebitis. One can tell whether this injection is taking hold, because immediately the patient's legs get an increase in warmth. In both cases the visible contracture of the vesical outlet disappeared on cystoscopy, so we were saved the embarrassment of having operated on a functional rather than an organic bar, which is something to hold in mind. It is very important that we observe residual urine trabeculation of the bladder and a palpable lesion. Do the authors advocate prostatic massage in any of these cases?

DR. HERMAN L. KRETSCHMER, Chicago: I agree in part with Drs. Folsom and O'Brien; what I disagree with is the title of their paper. Obstruction at the neck of the bladder in both children and adult females is a rare lesion. However, it occurs more frequently than is generally recognized. Many girls and women with trabeculation and hydronephrosis have as the underlying cause obstruction at the bladder neck. This condition is frequently overlooked and, as a rule, the patients when consulting the doctor come in late in the course of the disease, after irreparable damage to the upper urinary tract has occurred. Therefore it behooves all of us to be on the lookout for these cases, to remove the obstruction before damage to the upper urinary tract has taken place. I agree with the authors that the treatment is transurethral resection. The patients belong to this group on whom we have performed transurethral resection. We have had most satisfactory results. The point on which I disagree is that of the selection of the title, namely "The Female Obstructing Prostate," because it is my opinion that the female does not have a prostate.

DR. VINCENT J. O'CONOR, Chicago: The lesion described by Drs. Folsom and O'Brien has been a matter of interest to me for a long time. I have encountered 9 women with unmistakable mechanical obstruction of the vesical neck. The authors have had the opportunity of studying Kodachrome photomicrographs of the tissue removed by transurethral resection in these 9 patients. The obstructing tissue removed from the patients we have seen has not been of uniform character. Some of these tissues are purely fibromuscular, some are granulomatous or inflammatory and some have a predominance of glandular elements. I agree that the term "prostatism" in the female is quite misleading. We must not confuse these patients with the hermaphrodite or pseudohermaphrodite who actually appear to be female yet have male gonadal tissue. Before proceeding to resect an apparent obstruction at the bladder neck in women it is imperative that we recognize what, if any, part relaxation of the floor of the bladder plays. In cystocele, moderate or advanced, there often appears cystoscopically to be an increase in the size of the internal sphincter or vesical neck. The neurologic examination must be negative, there must be both visual and palpable tissue apparently obstructive in character and there must be residual urine that cannot be explained by relaxation of the bladder floor before the indications are clear for transurethral resection of the female bladder neck.

DR. A. I. FOLSOM, Dallas, Texas: Those women that Dr. Ockerblad had apparently knew better about what was the matter with them than he did. He said the less you do for them the better. That isn't my experience. Dr. Nesbit's suggestion of a neurogenic contraction of the internal vesical sphincter is a thing which I am not sufficiently familiar with to discuss, but my impression is that the neurogenic disturbance of the internal vesical sphincter is a relaxation. He asked if I massaged these. As a matter of fact I massaged one for him in his own clinic one day and showed him the secretion coming out of the duct. Dr. Kretschmer takes issue with me as to the term. I don't know any better term for it and I don't see any use of quibbling over terms. Caldwell, whom I consider to be as good a pathologist as there is in this country, has definitely gone on record as saying that there is a definite homologue of the prostate. I am surprised that you do not know that Virchow found prostatic calculi in women in the posterior part of the urethra, and if you will look at the article that I first published in 1931 you will find a beautiful illustration of a large prostatic calculus and there are corpora amylacea. I do not care what you call it. If this is not the right thing to call it, we will call it something else, but, as a matter of fact, we have no proper term for the condition in the male. Prostatic hypertrophy is not adequate. I think there is no objection to calling this "female prostatism." O'Conor's suggestion about cystocele brings up a thing that I have very definite convictions about. I have many records of women who have been operated on for cystocele, for relief of bladder irritation, and I have then had to go in and clear up a posterior urethral inflammatory lesion and get them well. Now I have no argument, of course, with the gynecologist about doing a cystocele operation of any kind that he wants to do as long as the indications are definitely gynecologic, but I believe that the gynecologist who operates on women with bladder trouble and does this repair of the cystocele purely for bladder trouble is going to fail ten times to where he succeeds once.

Clinical Notes, Suggestions and New Instruments

LEAD INTOXICATION FROM A BULLET LODGED IN THE SPHENOID SINUS AND SURGICAL REMOVAL OF THE NIDUS

LIEUTENANT COMMANDER CHARLES E. FUTCH

MEDICAL CORPS, UNITED STATES NAVAL RESERVE, RETIRED

The present war era will undoubtedly result in an intensified study of the effects of retained lead, and a brief review of the possibilities in such cases is apropos at this time. Lead intoxication from absorption by way of the mucous membrane of the nasal mucosa is rare: secondly, the removal of a bullet lodged in the sphenoid sinus is an unusual problem of surgery.

There has been some change in opinion from that expressed by Ambroise Paré[1] in the sixteenth century: "Experience

Fig. 1.—Anteroposterior view of the skull showing lead fragments at the point of entrance at the superior margin of the left orbit. The main body of the bullet may be seen lodged in the left sphenoid sinus.

teaches us that lead (which some say is poisonous because mercury is derived from it) can remain a long time in our bodies without causing any corruption: as we can recognize

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

1. Paré, Ambroise: Oeuvres completes d'Ambroise Paré, Paris, Malgaigne edition **3**: 347, 1840-1841.

in those cases of arquebus wounds where the ball has remained in the flesh a space of three, four and even ten years, and has moved from top to bottom without causing any putrefaction or harm: which demonstrates that [lead] has no poisonous qualities but rather possesses a familiarity with our nature." In contradistinction to Paré's opinion, there were physicians of the Middle Ages who definitely associated colic and palsy with lead. To Tanquérel des Planches [2] goes the credit of first correlating the manifestations and symptoms of lead intoxication.

The earliest reported case of plumbism caused by the retention of lead bullets was made by Bronvin [3] in 1867. Willard Machle [4] made a careful study of more than 40 cases and published a monograph on the subject of lead poisoning from retained bullets. This series, as presented by Machle, shows 3 cases of retention and of the removal of bullets from the head and brain, but no reference has been found in the total literature of the removal of a bullet from the sphenoid sinus.

It is stated by Cecil [5] that subcutaneous or intramuscular deposits of lead enter the blood stream so slowly that intoxication from bullets, if it occurs at all, is very rare; but it is now recognized that lead may be absorbed from the gastrointestinal tract, from the respiratory tract and also from the mucous membrane of the nose and mouth.

Fig. 2.—Lateral view of the skull showing the fragments of lead in the orbit and the bullet on the floor of the left sphenoid sinus.

REPORT OF CASE

J. W., a man aged 34, was assisted into the office, Dec. 23, 1941, by a friend. His legs apparently were not able to accept his body weight; he was pale, emaciated and apprehensive. He carried roentgenograms in his hand which he presented with the abrupt question "Can you take this bullet out?" When answered with a cautious affirmative, he demanded that the removal be done immediately, stating that he did not believe he would survive if this effort should be deferred. When advised that the operation in itself might result in mortality he was indifferent and continued to be insistent on immediate effort, even the day before Christmas. The attitude of the patient was impatient, irritable and mandatory.

The relevant history leading up to the present time was as follows:

In September 1931 the patient was engaged in target practice at a shooting gallery, where the 0.38 caliber revolver which he was using accidentally discharged. The bullet struck the left supraorbital ridge, where it split, a small part passing upward outside the frontal bone and a large fragment entering the orbital fossa. The fragment lodging externally was mostly removed. The patient further stated that he was unconscious and delirious an unknown period of time and was not expected to live for the first month after the accident. He was confined in the hospital for three months and returned to work four months after the accident. The fragment entering the orbital fossa was disclosed by roentgenograms to have lodged in the left sphenoid sinus, from which he was told the removal would be fatal.

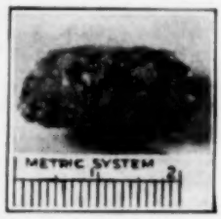

Fig. 3.—The extracted bullet.

During the next several years he noted but few symptoms referable to the accident. He occasionally noted some vague "distress" and a weird feeling in the vertex and experienced half-hour attacks of panting about once a month. No further signs or symptoms were observed until about two years before I saw him (eight years after the accident), when he began to note progressive aching in both legs, which he ascribed to long hours of work. This aching of the legs had increased during the last two weeks to the degree of being "unbearable." The patient also reported "split second" flashes of unconsciousness during the last two years, occurring about once every three to four weeks.

The patient consulted Dr. Leonard Thompson of San Pedro about six months before for a general physical examination, mainly because of the aching of his legs and a feeling of general weakness and extreme constipation.

At that time physical examinations and roentgenograms of the chest were reported negative. Two weeks before I saw him the patient experienced faintness, panting and chilliness which lasted for ten minutes and was followed by trembling of the upper extremities. Consulting his physician again, he was referred to me. On the basis of physical examination and x-ray study Dr. Thompson suspected lead intoxication.

Dr. Cullen Ward Irish saw the patient in neurologic consultation. Dr. Irish reported that in his opinion there was some toxicity of the central and peripheral nervous systems from the absorption of lead for the past ten years. Subjective and objective findings were as follows: Severe aching was experienced in the calves of the legs and across the shoulders and radiated into the upper extremities. There was little involvement of the motor nerves as is frequently seen in lead poisoning, and no wrist or foot drop. Atrophy in the muscles of the upper and lower extremities was obvious. This hypotonia and atrophy in the calves was ascribed to lead poisoning of the anterior horn cells of the spinal cord. The spasticity which appeared when the patient was sitting, standing and walking indicated that there was also some involvement of the spinal pyramidal tracts. There was some optic atrophy due undoubtedly to lead absorption. The scotoma as found in the left retinal field was undoubtedly caused by the initial bullet trauma. The brief losses of memory described by the patient were probably petit mal epilepsy, which attacks are not unusual in lead absorption. It was apparent in the recent past that there had been a rapid progression of symptoms, and in the neurologist's opinion the remnant of bullet in the left sphenoid sinus would have resulted fatally had not the nidus of absorption been removed.

Dr. Irish ordered the use of calcium by mouth and vein to attempt to fix disseminated and free lead in the bones.

LABORATORY OBSERVATIONS

The major physical and laboratory manifestations of plumbism as given in the series presented by Machle [4] are shown in the accompanying table. The comparison is made with observations set down in the last column on my patient.

The present case is exceptional in the fact that the laboratory tests for lead were all negative; however, the gastrointestinal, joint, muscle and central nervous system manifestations were severe and classic for lead intoxication.

2. Tanquérel des Planches: Traite des maladies de plomb ou Saturuines, Paris, 1839.
3. Bronvin, de Sion: Etiologie de la colique de plomb, Union méd. 3: 89, 1867.
4. Machle, Willard: Lead Absorption from Bullets Lodged in Tissue: (Report of Two Cases), reprinted with additions from J. A. M. A. **115**: 1536-1541 (Nov. 2) 1940.
5. Cecil, R. L.: A Textbook of Medicine, Lead Poisoning, Philadelphia, W. B. Saunders Company, 1940, p. 547.

OPERATION

The approach to the left sphenoid sinus was done by the submucous route. The submucous resection was carried farther posteriorly from the bony septum and the mucous membrane dissected from the anterior face of the sphenoid sinus. Sewall's sphenoid chisel was used to remove the anterior wall of this sinus, and the opening was enlarged with the Faraci sphenoid punch. With focal illumination, after suction, the edge of the bullet fragment was seen and grasped with the Hartmann forceps and rocked back and forth until it was felt to be free, and then the bullet was removed. A permanent opening was made through the mucous membrane of the anterior wall of the sphenoid by nasal approach. The mucous membrane was approximated and gently packed in position. There was little bleeding, and the patient made an uneventful recovery with definite improvement in the nasal breathing following the incidental submucous resection.

COMMENT

The patient at this time, approximately five weeks after the operation, is remarkably improved in general health, has discarded in turn crutches and double cane and now carries but one cane, which he says he feels he will soon dispose of permanently. The patient has lost his irritability, his petit mal attacks and his extreme constipation and says that he now feels mentally and physically more adequate to carry on than at any time since his initial accident.

Summary of Forty Reported Cases

	Machle's Cases			Present Case
Interval to onset	12 days to 48 years; less than 1 year, 12; 1 to 10 years, 5; 10 or more years, 17 (6*)			8 years
Location of missile	Bone and joint, 24; soft tissue, 13 (3*); bathed with synovia, 8			Sphenoid
Type of missile	Bullet 19, shot 11, shrapnel 7 (3*)			Pistol bullet
	Present	Absent	No Information	
Dissemination	15	1	24	Yes
Associated diseases	26	1	13	No
Vomiting, constipation or colic	26	2	12	All three
Arthralgia, paralysis or central nervous system symptoms	28	1	11	Yes, severe
Lead line	15	8	17	No
Stippling	14	5	21	No
Anemia	12	4	24	No
Lead in urine	Significant concentration 2, present (qualitative) 9, absent 3 (26*)			No
Recovery	Complete 11, partial 2, died 5 (22*)			Yes

* Number of cases in which there was no information.

CONCLUSIONS

1. A man aged 34 has carried a lead bullet in the left sphenoid sinus for ten years as the result of the accidental discharge of a revolver.

2. Symptoms of true lead intoxication began approximately eight years after the accident and were characterized by nausea, extreme constipation, arthralgia (severe in the inferior extremities), spasticity of the muscles of the inferior extremities when at rest and some toxic dementia.

3. Laboratory findings were not positive as was expected.

4. The bullet was removed by submucous resection approach. No complications were encountered.

5. The patient has improved rapidly relative to all symptoms six weeks after removal of the bullet.

6. A neurologist has advised giving large amounts of calcium to fix free lead that may be present in the tissues.

1930 Wilshire Boulevard.

Special Articles

ANDREAS VESALIUS AND THE "FABRICA" 1543-1943

ARTURO CASTIGLIONI
NEW HAVEN, CONN.

Among the classics of the Renaissance which truly represent the struggle and glory of that period, the Fabrica of Vesalius holds a foremost place. Written by a learned humanist and an indefatigable research worker, a great physician and a fine artist, it is still worthy of our admiration as a magnificent product of science and art.

Andreas Vesalius was born in Brussels on Dec. 31, 1514 and numbered many distinguished physicians among his kin. In early youth he began the study of anatomy, which he pursued at Louvain and Paris. He soon recognized that the professors, who taught out of Galen and relegated dissection to barbers, could neither teach nor even learn. Convinced of Galen's infallibility, they shunned personal observation and ignored research. When war between the German emperor and the king of France paralyzed the University of Paris, Vesalius returned to Louvain and then went to Italy, where anatomy was taught actively in many schools. He resided first in Venice and then in Padua, where on the sixth of December 1537, the day after his promotion to Doctor of Medicine, he became professor of surgical medicine and anatomy at the school which the proud republic of Venice considered as its most precious treasure. Padua was the center of the scientific thought of the Renaissance, and the young Fleming was soon its most popular teacher.

Within five fervid years his life's great work was begun and ended. In the year 1537 his first writing, a Commentary on Rhazes, was published in Louvain. In 1538, in order to offer a correct guide for students, surgeons and artists, he published the six Anatomical Tables, three of which had been drawn by his friend and countryman Stephen van Calcar and three by himself. These were a definite innovation in anatomic illustration and were promptly plagiarized. In 1540 he published the Commentaries on the anatomic books of Galen. In this same year he began to collect observations and prepare the drawings for his master works, the Epitome and the Fabrica. The first was planned as a guide to anatomy for common people and at the same time acted as an announcement for the more extensive work, which came to light in a splendid edition by Oporinus in Basel on May 5, 1543.

At the beginning of his anatomic teaching Vesalius felt the desire to recall from the dead the science of the ancients, which he believed to have been misunderstood and misinterpreted by their followers and their commentators. It was the current tendency of the Renaissance to return to the pure sources of the classics and to free the schools from the teaching of the Arabs. Vesalius said explicitly that his aim and his hopes were that anatomy "could reach such a point to be equal to that of old." The respect for the ancients was alive in him. At Padua, where he was charged "by the illustrious Senate of Venice, which is far the most liberal in the endowment of the higher branches of learning, with the teaching of surgical anatomy," he devoted the greatest effort to his investigations "in a way that nothing could be found in his procedure that fell short

of the traditions of the ancients." The Anatomical Tables (1538), which had to replace the traditional fugitive sheets which were very popular among students and physicians, brought the first attempt of reproductions from direct observation. But Vesalius still accepted the galenic anatomy or at least he had not yet corrected many of its mistakes. The anatomy of the liver, of the uterus, of the bladder, of the sternum is still galenic. But he had begun to dissent, trying first to rely on the authority of pregalenic scholars, believing that the Alexandrian anatomists, having dissected human bodies, had really possessed a better knowledge of anatomy. The study of Galen's work, which he made with the greatest diligence in order to prepare the new edition of the anatomic books, published in 1540 by the Giunta in Venice in a splendid and very accurate form, gave the proof of the astonishing fact that "in the manifold and infinite divergence of the organs of the human body from those of the monkeys Galen had hardly noticed anything except in the fingers and the bend of the knee." Now, definitely sure of this fact, in the first edition of the Fabrica the young professor of anatomy took his stand. He knew and clearly proved and affirmed that it was impossible to rely on Galen and that the story of anatomy had to begin anew. He rebelled against the anatomists who asserted that in Galen's books not even the slightest error could be found, that any other book on anatomy was absolutely useless and had to be condemned to the stake. He fought against the absurd assertion that, if some differences from Galen's description should be found in the anatomy of human bodies, these had to be ascribed to the changes to which the organs may have been subjected in the course of time, but not to an error of the Prince of Physicians, which was inadmissible. Vesalius could not countenance servile adherence to Galen, which meant renunciation of independent observation and free judgment. He starts from anatomy, which he correctly considered the foundation of medical knowledge.

The program and the original conception of the work are given by the title itself.[1] It was conceived as a complete system of anatomy ordered in an organic way and based exclusively on independent personal observation. The dissection is no longer a pure formality, the barber or the surgeon has nothing more to do in the anatomic theater. The professor himself, without the help of any book, has to dissect and teach. The frontispiece of the Fabrica, where the teacher appears in the act of dissecting and explaining, is an eloquent declaration of principles.

The text of the book is in perfect accord with this program. The exposition of the subject is ordered so that the reader may obtain an exact knowledge of all structures. There are no longer isolated descriptions of single organs or claims to new discoveries. The whole anatomic structure of the human body is examined and studied in its integrity. Every organ, every bone, every muscle, every vessel finds its correct place in the general design, its denomination, the exact description of its anatomic form, the explanation of its functions.

The Fabrica is the book of a man of the Renaissance who, having started from humanism with a sound knowledge of Greek, Latin and Arabic authors, had emancipated himself from the tradition and was fully aware of the originality of his observations and conclusions. The personality of the teacher is constantly predominant. The direct communication with the pupils is evident. Vesalius presented first his own observations, then the mistakes of other authors and his corrections, never posing as an authority but always inciting the reader to examine, to control and to judge by himself.

The illustrations of the book are an essential part of this work. Stephen van Calcar was a fine artist and a keen observer, whose name deserves to be perpetually bound to Vesalius's glory; we know that every single drawing was made under the guidance of Vesalius, who took great care in supervising the engraving and discarded the pictures which he did not like or which had not come out satisfactorily.

The figures of the Fabrica belong to the most interesting pages in the history of art in the Renaissance. The men in Vesalius's book are alive; their muscles are in action. The general figures are in attitudes which remind one of the Antinous or the Aphrodite of classic times, sometimes meditating on the problem of life or death as figures of a great drama, who show the inner secrets of their life. I may say that the animating spirit of the Renaissance has revived the corpses of the criminal or the prostitute, made them appear on the beautiful background of the Italian landscape and invested them with a touch of beauty and of glory. They form the link between the free and joyous life of the Renaissance and scientific thought; the eloquent witnesses who stand forever as the proof of the vesalian struggle.

There are books which play in history the role of battles. Vesalius's Fabrica was such a battle, fought by one man alone against a host of enemies; a battle from the first to the last page, sometimes fought with a chivalrous respect for the adversary, sometimes with strong blows.

With this book, in the twenty-eighth year of his life, Vesalius reached the climax of his activity and deliberately threw himself into one of the fiercest battles which ever was fought for independence of thought against tradition and authority. The world of the scientists was upset; in Paris Vesalius's teachers were the first to attack their former pupil; in Germany Galen's authority was still holding sway; in Italy not all of Vesalius's pupils accepted the truths he had proclaimed. A great number of books, of pamphlets, of letters addressed to scientists and princes found their way into publicity in order to undermine the position of the rebel. Vesalius, deeply hurt, gave a prompt and sometimes violent answer to his opponents; then he left his school, burned his books and among them destroyed some works not yet published. He became the physician of Charles V, followed the emperor in his journeys and later became physician to Philip II of Spain. The history of the last years of his life, of his pilgrimage to Jerusalem, of his death on the island of Zante, where he landed ill, unknown and abandoned, has often been told, but the mystery of his end has not yet been solved. One thing is sure, however: after the publication of his anatomic books, his work as teacher and as anatomist was brought to an end. From the first day when he began his public dissections at Padua until the last moment of his life, he stood courageously against all his enemies, answering with good arguments. He never recanted one word of what he had written, never changed his attitude and always maintained full responsibility for his assertions and absolute faithfulness to his principles.

1. De humani corporis fabrica libri septem.

The Fabrica was published contemporaneously with another revolutionary book, written by another learned physician and former student at Padua: the Revolutions of the Celestial Bodies by Nicolas Copernicus. Vesalius's work found its way notwithstanding the violent attacks, the vulgar offenses, the accusation of heresy and in spite of the lukewarm hypocritical eulogists and the brazen plagiarists. The contests and the discussions which arose at the time of its publication are nowadays forgotten and the names of Vesalius's enemies, the great professors who embittered his life and were respected as infallible authority, have only a remote historical resonance, but the date of the publication of the Fabrica marks a definite event in the history of science, the beginning of scientific anatomy.

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HANDBOOK OF NUTRITION: XXIII

MEDICAL EVALUATION OF NUTRITIONAL STATUS

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NEW YORK

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—ED.

Evaluation of nutritional status is designed primarily to determine whether a person is malnourished. At once this stated aim raises several questions. What is malnutrition? What are its specific manifestations? If it is to be recognized, its characteristics must be known. Which of these should be selected as a basis for detection? Assuredly the methods must be founded on qualities which adequately represent malnutrition.

The very name evaluation of nutritional status indicates that the procedure includes something more than placing a person in either of the two categories: well nourished or malnourished. If malnutrition is found it is also desirable to ascertain its severity. Malnutrition occurs in all degrees. If a sufficiently large number of persons at random were examined by the most sensitive and specific methods, their nutritional condition would form a continuous series from perfection to extreme malnutrition. It is necessary to classify the series into degrees, to establish standards and to have a scale of rating. Then a person's status may be compared with standards and rated accordingly. Here we are concerned with something more than detection of malnutrition; we also want to measure it. For this is needed a system of examination which is not only specific but also sensitive. The methods must permit distinction of fine differences in measuring malnutrition.

In answering the questions What is malnutrition? and What items should be examined? it will be seen that the concept of malnutrition, the methods and criteria of evaluating it are inseparably linked. For the methods and criteria reflect the views on the nature of malnutrition. All three aspects have been undergoing an evolution during the past half century.

CROSS SECTIONAL METHODS OF EXAMINATION

Most of the methods of examining for nutritional status have been devised for application on large groups of persons, especially school children and army recruits. Here the examination is a screening process that will both separate and rate the malnourished.

One of the early methods, the physician's estimate from inspection, has undergone a series of changes. In 1905 Koppe [1] regarded nutrition as one of eight components of constitution. To him nutritional status was indicated by the amount of panniculus adiposus. Each of the constitutional components, including subcutaneous fat, was rated in five grades. The grades for all components totaled and averaged gave the score for constitution. Obviously nutritional status was completely obscured in constitution.

In 1908 Gastpar [2] used three items for judging and five grades for designating nutritional status. Pupils were divided into two groups, anemic and nonanemic, according to the circulation in cutaneous and mucous membranes. The first group was then divided into two, the latter into three subgroups according to musculature and subcutaneous fat. The grades were: good, fair, poor, fair and anemia, poor and anemia.

Hogarth [3] appraised nutrition as part of physical condition. The latter was composed of three factors: physical stature, general nutrition, circulation in the superficial membranes. Each factor could be rated in five possible grades. Musculature and panniculus adiposus were the basis of judgment for nutrition. The possible ratings were (1) excellent muscular development, (2) well nourished and healthy, (3) medium, (4) thin or fat and flabby tissues, (5) very thin. But nutrition lost much of its identity in the three figured score for physical condition.

According to Howarth [4] physical state is evidenced by height, weight and nutrition. His basis of judging nutrition was: skin and mucous membranes, hair, alertness, muscular tone. There were three grades of nutrition.

In the Dunfermline system [5] the following points were taken into consideration: height and weight in relation to age; general appearance; mucous membranes, skin and subcutaneous tissues; muscular tone and development; facial expression, carriage, movements, voice, interest and attention. At first nutritional status was recorded as good (above average), medium (average) and bad (below average). Later "the nutrition of the healthy child of good social standing" was the basis of classification, being given the rating excellent. When nutritional status just fell short of this it was regarded as good. When it was on the borderline of serious impairment it was designated as "requiring supervision." When it was seriously impaired it received the notation "requiring medical treatment."

Against the systems of evaluation by inspection there was considerable criticism. In a frank critique the London County Council report [6] for 1909 pointed out serious difficulties. Anemia was so complicated by

1. Koppe, O.: Wie bestimmen wir die Konstitution der Schüler, Ztschr. f. Schulgesundheitspf. **18**: Der Schularzt, **3**: 219-224, 1905.
2. Gastpar: Die Beurteilung des Ernährungszustandes der Schulkinder, Ztschr. f. Schulgesundheitspf. **21**: 689-702, 1908.
3. Hogarth, A. H.: Medical Inspection of Schools, London, Oxford University Press, 1909, chapter 11, pp. 158-159.
4. Howarth, W. J., in Kelynack, T. N.: Medical Examination of Schools and Scholars, London, P. S. King & Son, 1910, chapter 3, p. 39.
5. Mackenzie, Alister: Seventh Annual Report on the Medical Inspection of School Children in Dunfermline 1912-1913, Edinburgh, Turnbull & Spears, pp. 18-20.
6. Report of the Education Committee of the London County Council Submitting the Report of the Medical Officer (Education) for the Twenty-One Months Ended 31st December, 1908, London, London County Council, 1909, pp. 16-19.

complexion that it was difficult to assess by inspection. Furthermore, it stated, the physician himself introduced a large personal element.

Indeed, the shortcomings of the inspection methods were numerous and serious. At first nutrition was overshadowed as a component of constitution or physical condition. But, even when nutritional status was the specific and sole objective, clinical examination in practice showed lack of uniformity and agreement. The general criticism was that it failed because of subjectivity in judgment. There are reasons for much of this subjectivity. As has been noted, there was no agreement on items regarded as indicative of nutrition for judgment of status. Then too, standards were relative rather than absolute. Laveran [7] remarked that estimate of status depended on comparison with variable or unsatisfactory standards. Conditions just previously or most frequently seen influenced the rating assigned to a person. Moreover, there was much variation in number and names of groups; i. e., in rating scale. But even when all these points of variation were fixed, there was still much disagreement. When a group of children were examined by several physicians, using the same items and scale, there was still no uniformity in the ratings.[8] Derryberry [9] stated "Whether a child is rated as malnourished or not depends more on the physician who is the examiner than it does on the actual condition of the child." It became clear that even under rigidly controlled conditions there was a large element of subjectivity in the physician's judgment.

In the need for an objective method of judging nutrition a new approach was taken. Since normal growth is a manifestation of satisfactory nutrition, growth was taken as a measure of the nutritive state. The immediate question then was: How shall growth be measured?

As weight and height had been used to follow growth and development, they were used to measure nutrition.[10] They were referred to each other, and individually or in combination to age: weight for age, weight for height, weight for height and age, and height for age. Standard weights were derived from statistical analysis of data collected on children supposedly in good nutritive condition. These standards were presented in reference tables.[11] In other instances weight and height were used in a simple ratio to give an index number which could be compared with a standard.[12]

As early as 1909 Oeder [10] and Oppenheimer [13] pointed to inaccuracies in using weight as the measure of nutrition. Gradually the reasons became clear. For one thing, as it was by no means certain what constituted normal growth, the suitability of available height and weight standards was open to question. Scarcely less difficult was the question: How much deviation from average should be allowed for individual variations? These points led to much cross criticism. But, troublesome as they were, there was still a more serious criticism.

From a study in which there was no more underweight in a group on a poor diet than in a group on a good diet,[14] the validity of weight as an index of nutrition was considerably shaken. Indeed, selection by weight was much less accurate than by clinical examination [15] when each was referred to dietary data. As might be expected, selection by weight and by clinical examination when compared directly showed serious disagreement.[16] In this discrepancy the clinical examination, for all its acknowledged shortcomings, was regarded as superior. Unfortunate as were the instances when children were diagnosed as malnourished by weight but were well nourished according to clinical examination, much more serious were the instances when children rated by weight as well nourished showed pronounced signs of malnutrition. It was evident that methods employing weight as the measure were inaccurate for estimating the state of nutrition.

In retrospect it is seen that unwittingly the enormous misdirected labors over many years in using weight were based on a fallacy in logic. Because persons showing pronounced deviations in weight are malnourished, it was inferred erroneously that persons not showing these deviations are well nourished. Actually, on the basis of weight it is not possible to characterize normal nutrition. Nevertheless weight was extensively used in this country until 1930, when the mass of accumulated evidence against it overwhelmed it.

Meanwhile, as soon as the defects of methods using weight in association with height and age as a basis of judging nutrition became evident, steps designed to remedy them had been taken. Most attempts were aimed at supplying new standards in the hope of making the methods accurate. These modifications, developed simultaneously, took several lines.

One type was the determination of standards of weight in normal nutritive condition. In attempting to appraise the nutritive status of adults by weight, Oeder [17] encountered difficulties similar to those in using the method during growth. He attempted to find the normal nutritive condition so that he might determine the range of body weight associated with it. Of bodily constituents, fat was found to be the one

7. Laveran, quoted by Pignet: Du coefficient de robusticité, Bull. méd. **15:** 373-376, 1901.

8. Franzen, Raymond: Physical Measures of Growth and Nutrition, New York, American Child Health Association, 1929, chapter 1, pp. 1-17. Derryberry.[9]

9. Derryberry, Mayhew: Reliability of Medical Judgments on Malnutrition, Pub. Health Rep. **53:** 263-268 (Feb. 18) 1938.

10. Oeder, Gustav: Das Körpergewicht des erwachsenen Menschen bei normalen Ernährungszustand und seine Berechnung, Ztschr. f. Versicherungsmed. **2:** 2-12 (Jan.) 1909. Paton, D. N., and Findlay, Leonard: Child Life Investigations: Poverty, Nutrition and Growth; Studies of Child Life in Cities and Rural Districts of Scotland, Medical Research Council, Special Report Series, No. 101, London, His Majesty's Stationery Office, 1926, pp. 48-57.

11. Baldwin, B. T., and Wood, T. D.: Weight-Height-Age Tables for Boys and Girls, New York, American Child Health Association, 1932.

12. Greenwood, Arthur: The Health and Physique of School Children, Westminster, P. S. King & Son, 1913, chapter 2, pp. 10-11.

13. Oppenheimer, Karl: Ein Versuch zur objectiven Darstellung des Ernährungszustandes, Deutsche med. Wchnschr. **35:** 1835-1838, 1909.

14. Hughes, Elizabeth, and Roberts, Lydia: Children of Preschool Age in Gary, Indiana, Bureau Publication 122, U. S. Department of Labor, Children's Bureau, 1922, part II, pp. 101-102.

15. Roberts, Lydia: The Nutrition and Care of Children in a Mountain County of Kentucky, Bureau Publication 110, U. S. Department of Labor, Children's Bureau, 1922, pp. 28-32.

16. Manny, F. A.: A Comparison of Three Methods of Determining Defective Nutrition, Arch. Pediat. **35:** 88-94 (Jan.) 1918. Clark, Taliaferro; Sydenstricker, Edgar, and Collins, Selwyn D.: Weight and Height as an Index of Nutrition; Weight and Height Measurements of 9,973 Children Classified upon Medical Examination as "Excellent," "Good," "Fair" or "Poor" in Nutrition as Judged from Clinical Evidence, Pub. Health Rep. **38:** 39-58 (Jan. 12) 1923. Baker, S. Josephine, and Blumenthal, J. L.: Methods of Determining Malnutrition, Nation's Health **5:** 47-50 (Jan.) 1923. Clark, Taliaferro; Sydenstricker, Edgar, and Collins, Selwyn D.: The New Baldwin-Wood Weight-Height-Age Tables as an Index of Nutrition: The Application of the Baldwin-Wood Standard of Nutrition to 506 Native White Children without Physical Defects and with "Good" or "Excellent" Nutrition as Judged from Clinical Evidence, Pub. Health Rep. **39:** 518-525 (March 14) 1924. Dublin, L. I., and Gebhart, J. C.: Do Height and Weight Tables Identify Undernourished Children? New York, New York Association for Improving the Condition of the Poor, 1924.

17. Oeder, Gustav: Der "normale" Ernährungszustand des erwachsenen Menschen, Med. Klin. **5** (2): 1225-1229, 1909.

altered most extensively in starvation and adiposity, representing extremes of nutritive disturbance, and the one reacting most sensitively to change in nutrition. Consequently he regarded fatty tissue as the index of nutritive condition. He listed four signs of normal nutritive condition, including a definite thickness of fat layer on the abdomen. He recorded the normal range in the thickness of this fat layer and the corresponding body weight. Then his line of reasoning led him to displace use of weight by measurement of the fat layer on the abdomen.[18]

Another kind of attempt to improve the use of weight methods was the calculation of normal standards in relation to physique. By 1912 it was becoming apparent that variations in type of body build had to be considered in judging growth by weight and that these variations had to be taken into account in the prediction of normal weight. During the latter half of the nineteenth century several index numbers derived from formulas containing various bodily measurements had been used in following physical development or expressing body build or constitution.[19] Some of these contained weight as a factor. As Bornhardt [20] pointed out, transposition in his equation made it possible to solve for weight. Several other formulas or ratios, most of them patterned after the earlier models, were proposed for determination of theoretical weight with which actual weight could be compared.[21] In other instances the procedure was to measure body build by dimensions other than weight and to note the weight associated with them.[22]

Still another approach ushered in the use of nutritional indexes. Recognizing the errors in judgment by weight and the subjectivity of a physician's inspection, Oppenheimer in 1909 devised a method that would be objective but have a clinical basis.[23] He argued that physicians, recognizing that certain bodily parts reflected malnutrition more sensitively and accurately than does weight, based their judgment subconsciously on the relation of these parts. Each physician, he asserted, tended to rate the nutritional status according to his estimate of musculature and adipose tissue. But individual judgment of these parts differed appreciably because of the difficulty in making proper allowance for the complicated differences in body build. To overcome this difficulty, Oppenheimer selected three bodily dimensions which reflected the relation of body parts decisive in the physician's estimate and which could be objectively measured. From these three dimensions he propounded two formulas: one gave the measure of nutrition, which increased with age and growth; the other gave the quotient of nutrition, which was influenced only by nutritive condition. Twenty-five years later the same rationale [24] and almost the identical measurements were adopted in working out the ACH index,[25] except that a different relation of measurements and a reference table were used.

Attempts to make allowance for variations in body build in the appraisal of nutritional status took another direction. With the realization that the ratio of height-weight failed to indicate accurately whether the amount of muscle and fat corresponded to the skeleton, other sets of dimensions were suggested. From anthropometric studies of growth Pirquet [26] found that weight referred to sitting height in the form of a ratio yielded a numerical index, "pelidisi," which he regarded as an objective measure of nutritive condition.

At the same time the widespread prevalence of malnutrition in Austria and Germany during World War I created an emergency; the American War Relief Commission and Quakers [27] desired a rapid and objective method of selecting the children needing supplementary food. Ratios containing various physical measurements which had been used for many years to express body build, constitution or physical fitness were turned from their original purpose and were applied, either unchanged or changed, as measures of nutrition.[19] Several new but similar ratios appeared, some containing weight as an item. In all of them a change in a measurement and therefore in the resulting quotient, the index number, was regarded as indicating a shift in the nutritive status. Since these equations contained measurements presumed to reflect body build, they were regarded as more sensitive and accurate than weight-height in evaluating nutritional status.

But evidence showed that all these indexes, formulas, equations and ratios aimed to refine or replace the height-weight method had its same defects.[28] They

18. Oeder, Gustav: Die Fettpolsterdicke als Index des Ernährungszustandes bei Erwachsenen, Med. Klin. **6** (1): 657-662 (April 24) 1910.

19. The early as well as the later indexes are cited in References on the Physical Growth and Development of the Normal Child, Publication 179, U. S. Department of Labor, Children's Bureau, 1927. They are described by Max Guttman (Ist eine objective Beurteilung des Ernährungszustandes des Menschen möglich?), Arch. f. Kinderheilk. **72**:23-49, 1923; Paton, D. N., and Findlay, Leonard: Child Life Investigations: Poverty, Nutrition and Growth; Studies of Child Life in Cities and Rural Districts of Scotland, Medical Research Council, Special Report Series, No. 101, London, His Majesty's Stationery Office, 1926, pp. 48-57; and McCloy, C. H.: Appraising Physical Status: The Selection of Measurements, Iowa City, University of Iowa, 1936.

20. Bornhardt, A.: Die Körperwägungen der Einberufenen als Mittel zur Bestimmung der Tauglichkeit zum Militärdienst, St. Petersb. med. Wchnschr. **3**: 108-109, 196-197, 1886.

21. Gaertner, Gustav: Körpergewicht und Körperlänge des Menschen, Wien. med. Wchnschr. **62**: 317-322 (Jan. 27) 1912. Oeder, Gustav: Das Körpergewicht des erwachsenen Menschen bei normalen Ernährungszustand und seine Berechnung;[18] Ueber die Brauchbarkeit der "proportionellen" Körperlänge als Massstab für die Berechnung des Körpergewichts erwachsener Menschen bei normalem Ernährungszustand, Med. Klin. **5**: 461-465 (March 28) 1909; Die Gärtner'sche Normalgewichtstabelle für Erwachsene, Berl. klin. Wchnschr. **52**: 1086-1092 (Oct. 18) 1915; Ein neuer "Index ponderis" für den "zentralnormalen" Ernährungszustand Erwachsener, Deutsche med. Wchnschr. **42**: 1073-1074 (Aug. 31) 1916.

22. Pryor, Helen B., and Stolz, H. R.: Determining Appropriate Weight for Body Build, J. Pediat. **3**: 608-622 (Oct.) 1933. McCloy, C. H.: Appraising Physical Status: The Selection of Measurements, Iowa City, University of Iowa, 1936, chapter 4, pp. 43-65; Appraising Physical Status: Methods and Norms, Iowa City, University of Iowa, 1938, chapter 4, pp. 34-47.

23. Oppenheimer, Karl: Ueber eine Methode zur ziffermässigen Bestimmung des Ernährungszustandes, Ztschr. f. Schulgesundheitspf. **22**:880-889, 1909; Ein Versuch zur objectiven Darstellung des Ernährungszustandes.[18]

24. Franzen, Raymond: Physical Measures of Growth and Nutrition, New York, American Child Health Association, 1929, chapter 1, pp. 1-17.

25. Franzen, Raymond, and Palmer, G. T.: The ACH Index of Nutritional Status, New York, American Child Health Association, 1934. Nutritional Status Indices: Method of Obtaining Measures of Musculature, Subcutaneous Tissue and Weight with Allowance for Skeletal Build (Boys and Girls, 7 to 12 Years of Age), New York, American Child Health Association, 1935.

26. Pirquet, Clemens: Sitzhöhe und Körpergewicht (System der Ernährung: II), Ztschr. f. Kinderh. **14**: 211-228, 1916.

27. Sonderheft über die Kinderspeisung in Deutschland, Herausgeben vom Deutschen Zentralausschuss für die Auslandshilfe, E. V. Berlin, Ztschr. f. Schulgesundheitspf. **35**: 177-240 (Nov. 7) 1922.

28. Clark, Taliaferro; Sydenstricker, Edgar, and Collins, Selwyn D.: Indices of Nutrition: Application of Certain Standards of Nutrition to 506 Native White Children without Physical Defects and with "Good" or "Excellent" Nutrition as Judged from Clinical Evidence, Pub. Health Rep. **38**: 1239-1270 (June 8) 1923. Guttman, Max: Ist eine objective Beurteilung des Ernährungszustandes des Menschen möglich? Arch. f. Kinderh. **72**: 23-49, 1923. Paton, D. N., and Findlay, Leonard: Child Life Investigations: Poverty, Nutrition and Growth; Studies of Child Life in Cities and Rural Districts of Scotland, Medical Research Council, Special Report Series, No. 101, London, His Majesty's Stationery Office, 1926, pp. 57-65. Souther, Susan P.; Eliot, Martha M., and Jenss, Rachel M.: A Comparison of Indices Used in Judging the Physical Fitness of School Children, Am. J. Pub. Health **29**: 434-438 (May) 1939. Jenss, Rachel M., and Souther, Susan P.: Methods of Assessing the Physical Fitness of Children, Bureau Publication 263, U. S. Department of Labor, Children's Bureau, 1940.

were vulnerable to the same criticisms. Actually, they revealed more about body build than about nutrition. Naturally the application of these methods to adults was based on other considerations than growth, but the results were just as unsuccessful as those on infants and children.

LONGITUDINAL PROCEDURE

In contrast to the preceding cross sectional methods of examining growth, the longitudinal procedure of following the growth-curve was also suggested as a measure of nutrition. Greenwood [29] proposed that the percentage growth per year in height and weight, respectively, be the standard of comparison. Failure to increase in weight at a given rate would bring a designation of malnutrition. According to one criterion, lack of gain or loss in weight for each month of three successive months was cited as a means of screening children with poor growth.[30] It has been asserted that the weight curve is the most accurate measure of growth.[31] This method has been successfully used in animal experiments in nutrition. But the animals were inbred and selected. Besides, they were subjected to dietary deficiencies with pronounced interference with growth. For both human beings and experimental animals, the so-called normal growth curves have changed over the past three decades. No one knows whether greatest growth has yet been obtained; whether greatest is optimum; in short, what optimum growth is. And no one knows how slight a deviation in growth curve should be regarded as malnutrition. Thus the very same objections to use of absolute weight may be leveled against the use of the growth curve.

Recently there appeared a method which combines the longitudinal and cross sectional procedures permitting application of either.[32] A grid prepared from height, weight and age is purported to give ratings during the period of growth on physique, development, nutrition and physical status. The slope or gradient of the developmental curve is said to give a measure of nutritional status. If measurements are limited to a single observation, a tentative estimate of nutrition can be made. Since height, weight and age are the only measurements used, it is similar to previous growth methods and it may therefore be open to the same difficulties and objections. Its class limits, admittedly arbitrary, are different, but it remains to be seen whether they are free of the defects which have restricted the use of all growth methods.

There is no desire to disparage or discredit the proper use of deviations in growth, shown by height or weight, as an indication of malnutrition. It should never be forgotten that an obvious and unequivocal disturbance in weight—or other measurements—indicate serious malnutrition. About this there has never been an argument. Used within this limitation—and this a serious limitation—a weight method has distinct value. It is when it is used beyond its restrictions that its fundamental defects emerge. It breaks down at the very point at which it is most needed, the borderline zone. It does not satisfactorily separate the slightly abnormal from the normal. Then when the scale is set at unequivocal limits the method is not a sufficiently sensitive screen for detecting malnutrition. In addition, for other reasons it will be seen that it is too inadequate and insensitive to serve as the primary screen of malnutrition.

In 1935 Dr. Roberts [33] wrote "It should be understood at the outset that the whole question of the use of growth criteria for assessing nutrition has been undergoing severe criticism in the last few years, and most of the commonly used methods have been largely discredited. We are indeed at the moment in a situation where we have lost confidence in the old methods and as yet have nothing new that is satisfactory to take their place." When this was written, little was at hand. But developments were in the offing. Through new knowledge nutrition had already extended into a new and vast domain. Among its many practical aspects, it opened a new and different approach to the evaluation of nutritional status. In the last few years, progress in this direction has brought forth new methodologies and has accentuated the distinct and fundamental limitations of previous procedures based on growth.

DEFICIENCY DISEASES

Following Eijkman's experimental production of beriberi by diet in 1897, Grijns formulated the conception of deficiency diseases.[34] He showed that certain foods contained an unknown essential substance which cured or protected against beriberi. When foods lacking the essential were eaten, beriberi resulted. It was clear that deficiency of an essential substance in food produced disease. To this substance Funk gave the name "vitamine."

It had long been known that calories were necessary for growth and maintenance; for with insufficient caloric intake, impaired growth or actual loss of weight, i. e. undernutrition, ensued. During the decade 1912-1922 it was found that a series of chemically unidentified substances, present in very small amounts in natural foods, were likewise essential for growth and maintenance. When the diet was deficient in any one of them, retarded growth or actual decrease in weight took place.

In the same period it was further shown that the "vitamine" protecting against beriberi was identical with one of the unidentified substances indispensable for growth. Then from animal experiments it was found that lack of each of the growth substances resulted in a separate, specific disease which had its analogue in man. Thus scurvy, xerophthalmia and rickets were found to be deficiency diseases, each arising from lack of a different substance. In this dual role each substance was essential not only for prevention of these diseases but also for promotion of growth. As additional essential substances were demonstrated, it was noted that a deficiency in each not only impaired growth but also produced a specific disease. More recently, pellagra and ariboflavinosis have been identified as defi-

29. Greenwood, Arthur: The Health and Physique of School Children, Westminster, P. S. King & Son, 1913, chapter 2, p. 11.

30. Turner, C. E., and Nordstom, Alfred: Extent and Seasonal Variations of Intermittency in Growth, Am. J. Pub. Health **28:** 499-505 (April) 1938.

31. Friedenthal, Hans: Allgemeine und spezielle Physiologie des Menschenwachstums, Berlin, Julius Springer, 1914, p. 47.

32. Wetzel, N. C.: Physical Fitness in Terms of Physique, Development and Basal Metabolism with a Guide to Individual Progress from Infancy to Maturity: A New Method for Evaluation, J. A. M. A. **116:** 1187-1195 (March 22) 1941.

33. Roberts, Lydia J.: Nutrition Work with Children, revised edition, Chicago, University of Chicago Press, 1935, chapter 3, pp. 42-43.

34. The developments leading to the modern concept of dietary essentials are reviewed in the book by E. V. McCollum, Elsa Orent-Keiles and H. G. Day: The Newer Knowledge of Nutrition, ed. 5, New York, Macmillan Company, 1939, chapter 2, pp. 15-31.

ciency diseases. Thus it has been demonstrated that lack of each essential substance produces a specific deficiency disease.

According to accepted nomenclature, each substance came to be designated by the generic name vitamin and an alphabetic letter. Thus xerophthalmia, beriberi, keratitis, pellagra, scurvy and rickets, the major deficiency diseases which historically have occurred in epidemics and endemics, resulted from lack of vitamins A, B_1, B_2, P-P, C and D respectively. With the chemical isolation and identification of the vitamins, it has been convenient to give each a more descriptive name as follows: B_1, thiamine; B_2, riboflavin; P-P, niacin (nicotinic acid); C, ascorbic acid. Vitamins A and D have yet to be given such a designation.

Meanwhile the concept of deficiency diseases had been extended to embrace those disorders arising from deficiency of essentials other than vitamins, e. g. protein, calcium and iron. Thus, lack of an essential, whether a vitamin, protein or mineral, produces its own particular and specific deficiency disease.

From these facts may be formulated the principles epitomizing the newer knowledge of diet and nutrition: (1) a number of essential substances are contained in food; (2) a deficiency of each essential substance in the diet interferes with growth and maintenance and induces a disease; (3) the relationship between the nature of the dietary deficiency and of the resulting disease is characterized by specificity. These principles have had a profound influence on nutritional science, especially the concept of nutritional status and means of appraising it.

This knowledge of dietary essentials gave a new approach to the detection of malnutrition. It suggested surveys in which diets were analyzed for deficiencies in the essential items.[35] This procedure is based on the assumption that evidence of dietary deficiency indicates impaired nutritional status, usually in the form of deficiency diseases. Despite its many possible sources of unavoidable inaccuracies, the dietary method yields highly informative results. But it has several drawbacks. It is costly, laborious and time consuming. By the time the data are collected and analyzed, the information is obtained many months after it is needed. Then too, it reveals only the most recent dietary habits. Thirdly, its evidence on malnutrition is indirect. Fourthly, it indicates only the malnutrition due to dietary deficiency. Nevertheless the information derived from it has been helpful, since deficient diet is the most frequent cause of malnutrition. To furnish information on cause is really its principal use. This method has shown that there is nationwide consumption of deficient diets [36] and suggests that there is widespread prevalence of malnutrition.

Along with the recognition that dietary deficiencies produce specific diseases came a period of closer study of these diseases leading gradually over the years to improvement in their detection. At first before their etiology was known these diseases, since they mostly occurred in combination in the same person, were not clearly differentiated and were therefore frequently confused. In time the major deficiency diseases were separated by their main characteristics and several accompanying signs. Even today this work of resolving deficiency diseases into pure form continues. Through inducing the experimental form and through curing the natural form by pure specific therapy, it has been possible to elucidate much about the specific and characteristic signs, the sequence of events and the site of early lesions in each major deficiency disease. In all this, animal experimentation has given many valuable clues. As a result, our knowledge of each deficiency disease in its acute manifest form has been greatly extended and refined. Not a few treatises have been written on these diseases. The older books contain very complete descriptions, although many points must be interpreted in the light of latter day advances.[37] Recent books and articles present newer developments.[38]

But with all this knowledge the occurrence of deficiency diseases in this country has not been generally noted except in city hospitals or endemic regions. Although nationwide dietary inadequacies have been revealed by surveys, frank deficiency diseases on such a scale have not been seen. According to their concept, clinicians rightly assert that they do not see deficiency diseases. But they are incorrect in concluding that there is no widespread prevalence of them. What are the reasons for this apparently irreconcilable conflict between the evidence from dietary surveys and from clinical observations? It is probable that many classic cases pass unrecognized. But even if these were detected and included, the statistics on the prevalence of deficiency disease would not come near approaching the figures on faulty diets recorded in surveys. There is a more significant reason for the seeming discrepancy. In assertions by clinicians that deficiency diseases are not generally prevalent, the traditional severe acute form

35. Bigwood, E. J.: Guiding Principles for Studies on the Nutrition of Populations, Geneva, League of Nations, Health Organization, Technical Commission on Nutrition, 1939, part I, pp. 20-137.

36. Stiebeling, Hazel K., and Phipard, Esther F.: Diets of Families of Employed Wage Earners and Clerical Workers in Cities, Circular 507, U. S. Department of Agriculture, Bureau of Home Economics, 1939.

37. Avitaminosen und verwandte Krankheitszustände, edited by W. Stepp and P. György, spezieller Teil in Enzyklopaedie der klinischen Medizin, Berlin, Julius Springer, 1927. Vedder, E. B.: Beriberi, New York, William Wood & Co., 1913. Marie, A.: Pellagra, translated by C. H. Lavinder and J. W. Babcock, Columbia, S. C., State Company, 1910. Wood, E. J.: A Treatise on Pellagra for the General Practitioner, New York, D. Appleton & Co., 1912. Niles, G. M.: Pellagra, an American Problem, Philadelphia, W. B. Saunders Company, 1912. Roberts, S. R.: Pellagra: History, Distribution, Diagnosis, Prognosis, Treatment, Etiology, St. Louis, C. V. Mosby Company, 1914. Harris, H. F.: Pellagra, New York, Macmillan Company, 1919. Hess, A. F.: Scurvy Past and Present, Philadelphia, J. B. Lippincott Company, 1920. Hess, A. F.: Rickets Including Osteomalacia and Tetany, Philadelphia, Lea & Febiger, 1929.

38. The Vitamins: A Symposium Arranged Under the Auspices of the Council on Pharmacy and Chemistry and the Council on Foods of the American Medical Association, Chicago, American Medical Association, 1939. Youmans, J. B.: Nutritional Deficiencies, Philadelphia, J. B. Lippincott Company, 1941. Williams, R. R., and Spies, T. D.: Vitamin B_1 (Thiamine) and Its Use in Medicine, New York, Macmillan Company, 1938. Jolliffe, Norman: Vitamin Deficiencies and Liver Cirrhosis in Alcoholism, Quart. J. Stud. Alcohol **1:** 517-557 (Dec.) 1940. The Neuropsychiatric Manifestations of Vitamin Deficiencies, J. Mount Sinai Hosp. **8:** 658-667 (Jan.-Feb.) 1942. Weiss, Soma, and Wilkins, R. W.: The Nature of the Cardiovascular Disturbances in Nutritional Deficiency States (Beriberi), Ann. Int. Med. **11:** 104-148 (July) 1937; The Nature of the Cardiovascular Disturbances in Vitamin Deficiency States, Tr. A. Am. Physicians **51:** 341-371, 1936. Sebrell, W. H., and Butler, R. E.: Riboflavin Deficiency in Man: A Preliminary Note, Pub. Health Rep. **53:** 2282-2284 (Dec. 30) 1938. Kruse, H. D.; Sydenstricker, V. P.; Sebrell, W. H., and Cleckly, H. M.: Ocular Manifestations of Ariboflavinosis, Pub. Health Rep. **55:** 157-169 (Jan. 26) 1940. Sydenstricker, V. P.; Sebrell, W. H.; Cleckley, H. M., and Kruse, H. D.: The Ocular Manifestations of Ariboflavinosis, J. A. M. A. **114:** 2437-2445 (June 22) 1940. Harris, Seale: Clinical Pellagra, St. Louis, C. V. Mosby Company, 1941. Sydenstricker, V. P., and Armstrong, E. S.: A Review of Four Hundred and Forty Cases of Pellagra, Arch. Int. Med. **59:** 883-891 (May) 1937. Spies, T. D.: Pellagra, in A Textbook of Medicine by American Authors, ed. 5, edited by R. L. Cecil, Philadelphia, W. B. Saunders Company, 1940, pp. 624-631. Eliot, Martha M., and Park, E. A.: Rickets, in Brennemann's Practice of Pediatrics, Hagerstown, Md., W. F. Prior Company, Inc., 1938, vol. I, chapter 36. Mackay, H. M. M., and Goodfellow, L.: Nutritional Anemia in Infancy with Special Reference to Iron Deficiency, Medical Research Council, Special Report Series, No. 157, London, His Majesty's Stationery Office, 1931. Youmans, J. B.: The Diagnosis of Nutritional Edema with Particular Reference to the Determination of Plasma Proteins and Consideration of their Behavior; in Nutrition: The Newer Diagnostic Methods, Proceedings of the Round Table on Nutrition and Public Health, New York, Milbank Memorial Fund, 1938, pp. 166-173.

has been meant. In this country this classic form is relatively infrequent; instead, the deficiency diseases are present in other forms.

The predominant clinical point of view has carried the concept that a deficiency disease begins or has its significance when it becomes perceptible, usually on simple inspection. Often all or most signs must be present. Clearly that point is not the beginning of the disease. Rather, the disorder is already well advanced before it is diagnosed. Such a practice does not detect the disease in its early or mild form. Over the years, numerous physicians have recognized this point.

Several early investigators attempted to divide the course of scurvy and pellagra into stages; they noted the earliest stage and its characteristics. Some, like Roussel,[39] interested in early diagnosis, set down their observations on the earliest sign, stressing the importance of discovering the site of initial change. Moreover, they distinguished a period before the disease proper appeared, before its well known signs were fully developed. As early as 1541 Echthius[40] enumerated symptoms by which "an approaching scurvy might be foretold"; in 1567 Wierus[41] described similar observations. Many subsequent observers recognized a prodromal, incipient or latent period in both pellagra[42] and scurvy.[43] Added still later were the names forme fruste, prepellagra or prescurvy, subclinical state. About 1917 other investigators conceived that a deficiency disease like scurvy might exist below the level of clinical detection by any sign, but to this state they applied names already carrying other connotations. Thus several names were applied to the same state; conversely, several states were designated by the same name or names. In scurvy Hess[44] drew distinctions which defined these several concepts. He recognized three types of scurvy: the florid, with well developed signs of the full blown condition; the subacute, the commoner form, presenting a group of incompletely developed symptoms; the latent, resulting from a negative balance in vitamin C during the period prior to the onset of clinical manifestations. In view of the importance previously attached to weight as an index of nutritional status, it is significant that Hess emphasized the normal weight of children affected with subacute scurvy.

At the same time it was recognized that scurvy might be observed in still another state, the so-called monosymptomatic state.[45] Cheadle[46] in 1878 had forecast this eventuality. This occurrence has been confirmed not only for scurvy but also for pellagra. During the last decade numerous epidemics or instances of gingivitis[47] and glossitis[48] demonstrated to be attributable to deficiency in ascorbic acid and niacin respectively have been observed. Some investigators have distinguished degrees of one sign in avitaminosis C.[49] Despite the differences in concepts about the several states and the lax use of terms applied to them, all investigators have agreed that most deficiency diseases occur in these states.

EARLY DIAGNOSIS

In recent years there has been a distinct trend toward early diagnosis of all diseases. It has been recognized that a disease starting with internal manifestations cannot be seen and may yield no signs until it is far advanced, even more so if the lesion is in a silent area, that a disease with early external signs may pass unnoticed into an internal phase or that disease with a persistent or progressive external lesion may develop to a considerable point below the level of perception. In short, most disease has reached the advanced state before it is detected by the unaided senses; its early or mild stage develops unobserved.

39. Roussel, Théophile: Traité de la pellagre et des pseudo-pellagres, Paris, J. B. Baillière et fils, 1866, chapter 1, pp. 4, 10.

40. Echthius, Jo.: De scorbuto, vel scorbutica passione, Epitome, 1541; cited by Lind, James: A Treatise on the Scurvy, ed. 3, London, S. Crowder, 1772, part 3, chapter 2, pp. 302-305.

41. Wierus, Jo.: Medicarum observationum hactenus incognitarum lib. I. de scorbuto cited by Lind, James: A Treatise on the Scurvy, ed. 3, London, S. Crowder, 1772, part 3, chapter 2, pp. 308-311.

42. Frapolli, Francisci: Animadversiones in Morbum, Vulgo Pelagram, Milan, Joseph Galeatium, 1771, pp. 19-21. Jansen, W. X.: De Pellagra, Morbo in Mediolanensi Ducatu Endemio Lugundi Batovorum, 1787, in Frank, J. P.: Delectus Opusculorum Medicorum Antehac in Germaniae Diversis Academiis Editorum, Ticini, P. Galeatii, 1790, 9, pp. 325-387. Titius, S. C.: Oratio de Pellagrae Morbi inter Insubriae Austriacae Agricolas Grassantis Pathologia Viteburg, 1792, in Frank, J. P.: Delectus Opusculorum Medicorum Antehac in Germaniae Diversis Academiis Editorum, Ticini, P. Galeatii, 1793, 12, pp. 121-176. Lussana, Filippo: Sulla Pellagra, Ann. Univ. de Med. **169:** 449-520, 1859. Tuczek, Franz: Klinische und anatomische Studien über die Pellagra, Berlin, Fischer's Medic. Buchandlung, 1893, pp. 10-25. Babes, Victor, and Sion, V.: De Pellagra, in Specielle Pathologie und Therapie, edited by Hermann Nothnagel, Vienna, Alfred Hölder, 1901., vol. 24, part 2, 2d half section 3, pp. 39-52. Roussel: Traité de la pellagre et pseudo-pellagres.[39] Sandwith, F. M.: Pellagra in Egypt, J. Trop. Med. **1:** 63-70 (Oct.) 1898; Pellagra, Encyclopaedia Medica, Edinburgh, William Green & Sons, 1901, vol. 9, pp. 244-249.

43. Lind, James: A Treatise on the Scurvy, ed. 3, London, S. Crowder, 1772, part 2, chapter 2, pp. 98-117. Echthius.[40] Wierus.[41] Brunerus, Balthazaro: De scorbuto tractatus duo, 1589, cited by Lind, James: A Treatise on the Scurvy, ed. 3, London, S. Crowder, 1772, part 3, chapter 2, pp. 315-317. Curran, J. O.: Observations on Scurvy as It Has Lately Appeared Throughout Ireland, and in Several Parts of Great Britain, Dublin Quart. J. M. Sc. **4:** 83-134 (Aug. and Nov.) 1847. Immerman, H.: Scorbut. Scharbock (Engl.: Scurvy), in Handbuch der allgemeinen Ernährungsstörungen, by Birch-Hirschfeld, H. Senator and I. Immerman, 2d half, pp. 581-603, in Handbuch der speciellen Pathologie und Therapie, edited by H. V. Z. Ziemssen, Leipzig, F. C. W. Vogel, 1876, vol. 13, 2d. half. Höjer: Studies in Scurvy.[47] Hutinel, V.: Les maladies des enfants, Paris, Asselin and Houzeau, 1909 vol. 2, pp. 451-453. Czerny, A. D.: Die Ernährung der deutschen Kinder während des Weltkrieges, Monatschr. f. Kinderh. **21:** 1-13 (April) 1921. Hess: Subacute and Latent Infantile Scurvy.[44] Morawitz, P.: Ueber hämorrhagische Diathesen, in Jahreskurse für ärztliche Fortbildung, Munich, J. F. Lehmanns, 1919, vol. 10, pp. 9-49. Mouriquand, G., and Michel, P.: Les états scorbutiques passagers et récidivants, Compt. rend. Soc. de biol. **1:** 734-737, 1921. Godlewski, Henri: Carence partielle et préscorbut, Presse méd. **29:** 682-683 (Aug. 27) 1921. Nassau, Erich, and Singer, M. J.: Zur Kenntnis des Vorstadiums der Barlow'schen Krankheit, Jahrb. f. Kinderh. **98:** 44-62, 1922. Leichtentritt: Klinische und experimentelle Barlow-Studien.[45] Kleinschmidt, H.: Latenter Skorbut oder infektiöse Purpura? Arch. f. path. Anat. u. Physiol. **246:** 131-139, 1923. Freund: Barlow'sche Krankheit.[45] Frölich, Theodor: Malnutrition and Latent Scurvy, Arch. Dis. Childhood **10:** 309-312, 1935.

44. Hess, Alfred F.: Subacute and Latent Infantile Scurvy: The Cardiorespiratory Syndrome (a New Sign), J. A. M. A. **68:** 235-239 (Jan. 27) 1917.

45. Leichtentritt, Bruno: Klinische und experimentelle Barlow-Studien, Ztschr. f. d. ges. exper. Med. **29:** 658-708, 1922. Freund, Walther: Barlow'sche Krankheit: Kindlicher Skorbut, in Handbuch der Kinderheilkunde, edited by M. von Pfaundler and A. Schlossman, ed. 3, Leipzig, F. C. W. Vogel, 1923, vol. 1, pp. 716-717.

46. Cheadle, W. B.: Three Cases of Scurvy Supervening on Rickets in Young Children, Lancet **2:** 685-687 (Nov. 16) 1878.

47. Hanke: Diet and Dental Health.[49] Kramer: Untersuchungen über C-Hypovitaminosen bei Paradentopathien nach der Methode Tillman, modifiziert von Jezler und Niederberger, der deutsche Militärarzt **2:** 489-493 (Dec.) 1937. Demoulin, Pierre: Résultats favorables obtenus par l'emploi de la vitamine C dans la thérapeutique des gingivites marginales, Rev. belge de stomat. **35:**164-170 (June) 1938. Roff, F. Stanley, and Glazebrook, A. J.: The Therapeutic Application of Vitamin C in Peridental Disease, J. Roy. Nav. M. Serv. **25:** 340-348 (Oct.) 1939; The Therapeutic Use of Vitamin C in Gingivitis of Adolescents, Brit. Dent. J. **68:** 135-141, 1940. Bouillat and Ramiandrasoa, A.: Dix-huit gangrènes de la bouche dont treize guéries, traitées par l'acide ascorbique, Presse méd., 1st sem. 541 (May 22-23) 1940. Campbell, H. Gordon, and Cook, R. P.: Treatment of Gingivitis with Ascorbic Acid, Brit. M. J. **1:** 360-361 (March 8) 1941. Dechaume, M.: Gingivo-arthritites dentaires et avitaminoses, J. Canad. Dent. A. **7:** 420-422 (Aug.), 471-474 (Sept.) 1941. Martí, Gusto Solsona, and Sales, Ricardo I.: Vitamina C.: Vitaminoterapia en odontologia, Rev. Odont. **29:** 73-80 (Feb.) 1941. Crane and Woods.[49]

48. Jamin, H.: Stomatit d'autone, Arch. Inst. Pasteur de Tunis **14:** 126-129 (No. 1) 1925. Nogue: Epidémie de glossite observée au Sénégal, Bull. d. Soc. path. exot. et de sa fil. de l'Ouest-Africain **18:** 501-507 (No. 6) 1925. Mathis, C., and Guillet: Sur la nature de l'epidémie de glossites observée au Sénégal, ibid. **18:** 586-590 (No. 7) 1925. Katzenellenbogen, I.: Ueber eine epidemische Glossitis in Palästina, Arch. f. Dermat. u. Syph. **154:** 269-277, 1928. Aykroyd, W. R.; Krishnan, B. G., and Passmore, R.: Stomatitis of Dietary Origin, Lancet **2:** 825-828 (Oct. 14) 1939. Katzenellenbogen, I.: Nicotinic Acid in Endemic Glossitis, Lancet **1:** 1260-1262 (June 3) 1939.

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The trend to diagnosis of early or mild disease showed the limitations of the unaided senses. It became necessary to turn to instruments or procedures that would reveal changes within the body or extend vision beyond the limits of the unaided eye. The x-rays, the Wassermann reaction, chemical methods for blood, urine and tissue and the microscope for examination of blood, urine and tissue have added greatly to the physician's skill in earlier detection and diagnosis. Similarly, long ago the pathologist, recognizing that much was occurring below the threshold of his vision, turned to the microscope to open the realm of cellular pathology.

So it has been with the detection of deficiency diseases. The early and mild states are below the manifest level. The pathogenesis of deficiency diseases makes the existence of these states thoroughly understandable. Among the manifestations of a deficiency disease on a dietary basis are lowered concentrations of the essential factor in the blood, depleted storage in the body's reservoirs, diminished excretion, microscopic change in the tissue in the initial site, gross morphologic and functional change. These manifestations, it should be stated, are not necessarily or ordinarily concurrent. To detect these states below the manifest level, investigators have had recourse to new procedures and instruments. For most deficiency diseases these states have been demonstrated by appropriate methodology. Hess's [44] visualization of a state characterized by a negative balance in the vitamin has been confirmed by biochemical methods in analyses of blood and urine. Indeed, low blood values for ascorbic acid have been found in a definite proportion of population samples.[50] True, some investigators have argued that such values for ascorbic acid in the absence of other signs do not constitute scurvy. Judged by clinical criteria, the condition is not scurvy. Not until it has advanced to macroscopic tissue changes and developed signs is it designated scurvy. But that view draws a purely arbitrary distinction. Its justification is that it differentiates two states of severity in the process. One is the lesser developed state, the other the fully developed disease. But whatever the former is called, it is a step in the process. As a practical matter it may call for treatment.

Several procedures have been employed to elicit or detect the so-called monosymptomatic state before the sign has become manifest. It is obvious that the value of this approach for recognition of the incipient deficiency disease depends on testing or examining for the earliest sign. Instruments and methods have been devised for the detection of night blindness [51] and capillary fragility,[52] as evidence of avitaminoses A and C respectively. These conditions occur, but they are not monosymptomatic; for it has been shown that they are not the earliest signs of these avitaminoses.[53]

More illuminating on the existence of the early state in a deficiency disease has been the observation of morphologic changes imperceptible to the unaided eye. Beginning changes in bones in infantile scurvy revealed by x-ray examination have been described.[54] Biomicroscopy, however, has disclosed still more about the early state of several deficiency diseases. Just as the microscope was highly useful to the pathologist in extending his range of vision to lesser changes in postmortem tissue, it has now proved highly informative to apply it in deficiency diseases to changes in living tissues. It is particularly revealing when the tissue site among the first showing changes is selected for observation. Using this procedure, I have found early specific biomicroscopic changes in four deficiency diseases: in the conjunctiva in avitaminosis A,[55] in the cornea in ariboflavinosis,[56] in the tongue in aniacinosis [57] and in the gum in avitaminosis C.[58]

Thus, alteration in transport and storage and microscopic changes in tissue show that deficiency diseases do exist in an early state which is undetectable by ordinary clinical methods.

In this morphologic study of these deficiency diseases, with biomicroscopic in conjunction with macroscopic examination, it was possible to see all gradations and to reconstruct the sequence of changes. These observations, combined with the results from administration of specific therapy, revealed new states. Besides the severe and early acute forms, I noted chronic states of varying intensity from mild to severe. These chronic states took on immediate significance because of their predominance in the population.

While each of the four deficiency diseases avitaminosis A, ariboflavinosis, aniacinosis and avitaminosis C has its individuality as a separate and specific entity, all in the evolution and recession of their particular lesions showed a similarity in their biologic behavior. They reflected a definite biologic pattern. From this was elaborated a concept of deficiency states, their nature, their evolution, how they may be recognized and their response to specific therapy.[59]

According to this concept, the specific pathologic process in a tissue in a deficiency disease [60] is characterized by velocity, intensity and duration. Of the velocities occurring, the range may be classified arbi-

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54. Park, E. A.; Guild, Harriet G.; Jackson, Deborah, and Bond, Marian: The Recognition of Scurvy with Especial Reference to the Early X-Ray Changes, Arch. Dis. Childhood **10**: 265-294 (Aug.) 1935.

55. Kruse, H. D.: Medical Evaluation of Nutritional Status: IV. The Ocular Manifestations of Avitaminosis A, with Especial Consideration of the Detection of Early Changes by Biomicroscopy, Pub. Health Rep. **56**: 1301-1324 (June 27) 1941; Milbank Memorial Fund Quart. **19**: 207-240 (July) 1941.

56. Kruse, H. D.; Sydenstricker, V. P.; Sebrell, W. H., and Cleckley, H. M.: Ocular Manifestations of Ariboflavinosis, Pub. Health Rep. **55**: 157-169 (Jan. 26) 1940. Sydenstricker, V. P.; Sebrell, W. H.; Cleckley, H. M., and Kruse, H. D.: The Ocular Manifestations of Ariboflavinosis, J. A. M. A. **114**: 2437-2445 (June 22) 1940.

57. Kruse, H. D.: The Lingual Manifestations of Aniacinosis, with Especial Consideration of the Detection of Early Changes by Biomicroscopy, Milbank Memorial Fund Quart. **20**: 262-289 (July) 1942.

58. Kruse, H. D.: The Gingival Manifestations of Avitaminosis C, with Especial Consideration of the Detection of Early Changes by Biomicroscopy, Milbank Memorial Fund Quart. **20**: 290-323 (July) 1942.

59. Kruse, H. D.: A Concept of Deficiency States, Milbank Memorial Fund Quart. **20**: 245-261 (July) 1942.

60. To many persons the term "deficiency disease" connotes a disorder arising solely from a deficiency in the diet. True, dietary inadequacy is the most common cause; but there are many other causes and conditioning factors. They are discussed in a separate article in this series by Dr. Norman Jolliffe. As the result of any of these causes and conditions, tissues are deficient in or cannot use the essential. It is desirable that the term deficiency carry this broader meaning.

trarily and most simply into two principal categories which are subdivided. The acute process is rapid in appearing, in running its course and in receding under treatment. Somewhat less rapid is the subacute or mild acute process. Differing from these in velocity, the chronic process is slow in onset, progress and response to treatment. Even slower is the mild chronic process.

Since the pathologic process may be of any intensity, it is convenient to graduate arbitrarily the range in two degrees, mild and severe. Therefore the acute and the chronic process may be either mild or severe. With grouping by form and intensity, the simplest classification of processes provides the categories mild acute, mild chronic, severe acute and severe chronic. These are the same groups that were enumerated in designating a process according to its velocity.

If uninterrupted, the process manifests its changes in a definite sequence which may be divided into stages. Therefore in each of the categories it may be divided into stages. Naturally the duration of the process will be a factor determining its stage.

(To be continued)

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE.

TENTATIVE MINIMUM REQUIREMENTS FOR ACCEPTABLE ELECTRICAL HEARING AIDS WERE PUBLISHED IN THE JOURNAL, MAY 11, 1940. THESE REQUIREMENTS ARE REVISED FROM TIME TO TIME AS THE RESULT OF THE IMPROVEMENTS AND CHANGES MADE IN THE INSTRUMENTS. THE COUNCIL ON PHYSICAL THERAPY WISHES TO EXPRESS ITS APPRECIATION FOR THE VALUABLE ASSISTANCE RENDERED IN THE PREPARATION OF THIS REPORT BY THE CONSULTANTS ON AUDIOMETERS AND HEARING AIDS. THE CONSULTANTS ARE DR. W. E. GROVE, CHAIRMAN, AND DRS. GEORGE M. COATES, EDWIN P. FOWLER, WALTER HUGHSON, ISAAC H. JONES, DEAN M. LIERLE, DOUGLAS MACFARLAN, C. STEWART NASH, HORACE NEWHART, PAUL E. SABINE AND BURT R. SHURLY.

HOWARD A. CARTER, Secretary.

MINIMUM REQUIREMENTS FOR ACCEPTABLE ELECTRICAL HEARING AIDS

A hearing aid acceptable to the Council on Physical Therapy of the American Medical Association shall improve at least 30 decibels for speech the hearing of the deafened ear for which it is prescribed or fitted. Firms shall meet the following requirements:

1. Hearing aids shall have imprinted on each transmitter and air or bone conduction receiver a model number (type or class) or some equally suitable identification.

2. The manufacturer shall supply the Council on Physical Therapy with a graph giving the amount of amplification.

3. The manufacturer shall state the voltage and current consumption at maximum setting.

4. The hearing aid shall be free from unwarranted noises, such as sizzling, frying, humming, clicking and whistling sounds.

5. The manufacturer shall furnish to the Council a copy of its guaranty to the purchaser.

6. There shall accompany each hearing aid clearly written instructions for its use.

7. The manufacturer shall give evidence that adequate facilities for servicing the instruments are available and shall furnish names and addresses of servicing agencies.

8. The manufacturer shall agree to furnish from stock to the Secretary of the Council on Physical Therapy a hearing aid for inspection and test. On the request of the Secretary, the manufacturer shall supply him with an order on any of the authorized agents for an instrument for test. On the completion of tests, the instrument shall be returned complete to the manufacturer.

9. All material used in manufacture shall be of first grade and the workmanship skilfully performed.

10. The firm shall be responsible for the ethical merchandising practices, financial dealing and contracts of its agents, sales representatives and service men with the purchasers of the instruments. The standards of merchandising and the acceptability of advertising shall meet the Rules of the Council on Physical Therapy.

REPORT OF THE COUNCIL

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

McINTOSH SINUSTAT ACCEPTABLE

Manufacturer: McIntosh Electrical Corporation, 223-233 North California Avenue, Chicago.

The McIntosh # 1518 Sinustat is said by the manufacturer to ". . . provide a simple means of obtaining various forms of sinusoidal and galvanic wave currents capable of producing rhythmic contractions of muscular tissue both striated and unstriated at frequencies corresponding to the norm of each." The unit is encased in a walnut cabinet measuring 20 inches by 13¼ inches by 12 3/16 inches and weighing 49 pounds. It is designed for operation on 100-115 volts, 60 cycle alternating current. Standard accessories include treatment cords, metal treatment handles, interrupting treatment handle with "spongio" disk, 4 by 6 "kantbern" pads and rubber bandages.

On the control panel of the unit are located a push button switch for selecting the kind of current, a meter recording patient current intensity, a red light and a green light indicating sinusoidal and galvanic currents respectively, two rheostats, one controlling the patient circuit and the other the speed of waves, a line switch and a polarity switch. A transformer, a heavy duty motor, a full wave rectifier tube, a condenser and a variable speed motor are mounted on the chassis.

McIntosh Sinustat.

The report of the Council's investigation of the apparatus is as follows:

The McIntosh # 1518 Sinustat is a generator designed primarily for electrical muscle stimulation. It has six current forms as follows:

1. A direct current, which is designated as a straight galvanic current. This is an essential current for muscle stimulation using the make and break technic, for ion transfer and other direct current applications.

2. A surging interrupted direct current, which is designated galvanic unidirectional current. This current can be used for the electrical stimulation of muscles with an intact nerve supply and where, in addition, the polar effects of the direct current are desired.

3. A surging uninterrupted direct current with alternate polarity, which is designated as a galvanic smooth; the form of this current, according to the name plate, is sinusoidal in form. This current is effective in the stimulation of paralyzed muscles, that is, muscles exhibiting the reaction of degeneration. This current was tested on patients and experimental animals.

4. A surging interrupted direct current with alternate polarity, which is designated galvanic rough. It is similar in form to 3, only interrupted. This is effective for the electrical stimulation of skeletal muscles with an intact nerve supply.

5. A tetanizing current, which is designated a 320 sinusoidal current. This produces a sustained tetanic contraction of the skeletal muscle with an intact nerve supply. This current produces similar effects to any faradic current. This current could be used for the so-called "muscle faradization."

6. A surging 320 cycle alternating current, which is designated as a 320 sinusoidal wave. Evidence is not available that this current is useful; in fact, the Council's experimental work tends to show that this type of current may produce harmful effects.

CONCLUSIONS

Current 1 is an essential current.

Current 2 can be used for the stimulation of a muscle with nerve supply intact and when at the same time constant polar effects are desired. It is not essential but can be used.

Current 3 is an essential current for the treatment of muscle giving the reaction of degeneration.

Current 4 is an essential current for the stimulation of a muscle when the nerve supply is intact.

Current 5 is not an essential current, although it will produce complete tetanus of a muscle. It can be used when a complete sustained tetanic contraction may seem desirable.

Current 6 is a current for which there is no definite evidence of usefulness or harmlessness.

The Council voted to accept the McIntosh #1518 Sinustat for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

AUSTIN E. SMITH, M.D., Secretary.

ZINC INSULIN CRYSTALS and CRYSTALLINE ZINC INSULIN INJECTION

Because of difficulty in arriving at a name which would accurately describe this insulin preparation and be approved by the Insulin Committee of Toronto, the Council has held in abeyance any report on this subject although the subject has been under consideration since the introduction of these agents into the medical armamentarium. Because of its responsibility to the public and to the physician the Council was of the opinion that it should not delay issuance of an explanation concerning the status of zinc insulin crystals but a desire to obtain complete cooperation from all interested bodies motivated a delay. However, the patents for insulin have expired and standards have now been set up by the United States Pharmacopeia for enforcement by the Food and Drug Administration.

Three forms, (1) solution of an amorphous form of insulin, (2) solution of protamine zinc insulin and (3) solution of zinc insulin crystals, are now available commercially and have been accepted for inclusion in New and Nonofficial Remedies. There have been two current designations for preparations of zinc insulin crystals; in the United States it was marketed as "Insulin specially prepared as Solution of Zinc Insulin Crystals" and in Canada as "Insulin made from Zinc Insulin Crystals." As the Council on Pharmacy and Chemistry was of the opinion that differentiation between "amorphous" and "crystalline" insulin was not made sufficiently clear by these designations, considerable correspondence was conducted with the Committee Advisory to the Insulin Committee of Toronto with a view to adoption of a name more accurately descriptive of the preparation. Finally, the designation "Solution of Zinc Insulin Crystals—a specially purified preparation of Insulin" was evolved and appeared to be satisfactory to both the Council and the Committee Advisory. This term was to encompass the product originally described as "Insulin, specially prepared in the form of zinc insulin crystals."

Just as it appeared that the status of the problem was ready for publication, correspondence arrived at the Council office indicating that the discussion was again to be opened. The arguments for this were not convincing to the Council, and it therefore held to its decision regarding the acceptance of the designation "Solution of Zinc Insulin Crystals—a specially purified preparation of Insulin," and voted to accept Zinc Insulin Crystals and Solution of Zinc Insulin Crystals—a specially purified preparation of Insulin, for inclusion in New and Nonofficial Remedies.

However, the U. S. P. Revision Committee adopted the following designations for insulin preparations, although at present the U. S. P. XII contains a monograph only on Insulin Injection:

Injectio Insulini (Insulin Injection)

Injectio Zinci-Insulini Crystallini (Crystalline Zinc-Insulin Injection)

Injectio Zinci-Insulini Protaminae (Protamine Zinc-Insulin Injection)

As a result of its consideration of commercially available insulin solutions made from zinc-insulin crystals, the Council concluded that clinically it is impossible to differentiate between Insulin Injection U. S. P. prepared from zinc insulin crystals and that prepared from amorphous insulin; and that under the provisions of the federal Food, Drug and Cosmetic Act a manufacturer could prepare a solution of zinc-insulin crystals and, without any statement as to its source, label and market it simply as Insulin Injection. Thus no label distinction between ordinary insulin solution and solution zinc-insulin crystals is required.

After reviewing the findings, the Council voted to publish immediately the foregoing statement and to accept for inclusion in New and Nonofficial Remedies, Zinc-Insulin Crystals and Crystalline Zinc-Insulin Injection.

ZINC INSULIN CRYSTALS.—Zinc insulin crystals occur as a crystalline preparation of the active antidiabetic principle of the internal secretion of the islands of Langerhans of the pancreas. The crystals contain a small amount of zinc (not less than 0.45 per cent and not more than 0.9 per cent), which is chemically combined with the active principle. The presence of zinc or some other heavy metal such as nickel or cobalt is essential because only in the presence of traces of such elements has the active antidiabetic principle been prepared in a pure crystalline form. Each milligram of the crystals is equivalent to approximately 22 units of insulin. The product is marketed in the form of crystalline zinc-insulin injection.

Zinc insulin crystals occur as small, colorless, rounded, untwinned, uniaxial, rhombohedral crystals, possessing a negative optic sign, parallel or zero extinction between crossed Nicols and a mean index of refraction for lithium light of 1.535 ± 0.002, with a birefringence of 0.005. It is sparingly soluble in water, insoluble in alcohol, chloroform and ether but soluble in dilute acid and dilute alkali. The isoelectric point of zinc insulin crystals is about 5.3. The crystals are stable if kept at a low temperature.

Transfer to a microscope slide approximately 0.1 mg. of zinc insulin crystals; add 0.1 cc. of distilled water; thoroughly wet the crystals by stirring with a small glass rod: the crystals do not dissolve completely but give rise to a turbid suspension; under microscopic examination the crystals conform to the petrographic description of zinc insulin crystals. The crystals brown rapidly when heated above 220 C. and melt with decomposition between 230 and 240 C.

Transfer about 20 mg. of zinc insulin crystals to a platinum boat; weigh the boat and its contents within a weighing "pig"; place the boat in a vacuum desiccator over phosphorus pentoxide and dry to constant weight using the weighing "pig" to prevent the absorption of water during weighing. The loss in weight does not exceed 7.0 per cent. In the following quantitative determinations it is more convenient to weigh the zinc insulin crystals directly and to calculate the results to a dry basis rather than attempt to weigh the extremely hygroscopic dry material.

Dissolve 50 mg. of zinc insulin crystals in 5 cc. of water by the addition of sufficient tenth-normal hydrochloric acid to effect solution; transfer to a centrifuge tube and add 2 cc. of 10 per cent trichloroacetic acid with shaking; let stand ten minutes and centrifuge; decant into a 10 cc. volumetric flask, add 2 cc. of Nessler's reagent and make up to volume; allow to stand five minutes; transfer to a colorimeter and compare with a standard made up similarly and containing 0.055 mg. of ammonium sulfate: the color does not exceed that of the standard solution.

Transfer 18 mg. of zinc insulin crystals to a 100 cc. volumetric flask, add 2 cc. of tenth-normal hydrochloric acid, dilute to the mark with distilled water and shake to dissolve the crystals. Transfer 10.0 cc. of this solution to a separator, add about 20 cc. water, 10 cc. chloroform and 2 cc. dithizon reagent (prepared by dissolving 15 mg. dithizon in 100 cc. redistilled chloroform). Make the solution alkaline by the addition of ammonia water and shake until the chloroform layer is colored a clear pink. Drain the chloroform layer into a clean flask and repeatedly extract the aqueous layer with small portions of chloroform to which has been added a few drops of dithizon reagent, until the chloroform is no longer colored pink. At this point the aqueous layer may be discarded. Transfer the combined chloroform extracts to a clean separator and extract twice with 15 cc. portions of 0.02 normal ammonia water to remove the excess dithizon. After each extraction, wash the water layer with a small quantity of fresh chloroform and then add to the main chloroform extract. Dry the combined chloroform extracts with a small quantity of anhydrous, reagent quality sodium sulfate, decant the solution into a 50 cc. volumetric flask, rinse the sodium sulfate several times with fresh chloroform and make the solution to volume with chloroform. Compare the solution in a colorimeter with a standard made as described above, using 10.0 cc. of a solution containing 0.001 mg. zinc per cubic centimeter (3.357 mg. zinc acetate [$Zn(C_2H_3O_2)_2.2H_2O$] per liter). The zinc content is not less than 0.45 per cent, nor more than 0.9 per cent.

Transfer about 10 mg. of zinc insulin crystals to a platinum dish; add two drops of concentrated sulfuric acid; ash slowly and ignite to constant weight at 600 C.: the ash is not more than 50 per cent more than the zinc sulfate calculated from the zinc content and in no case is it more than 3.30 per cent.

CRYSTALLINE ZINC INSULIN INJECTION.—A solution of zinc insulin crystals, a preparation containing the active antidiabetic principle of the pancreas, combined with a small amount of zinc (not less than 0.2 and not more than 0.40 mg. per thousand units of active principle in the solution).

Actions and Uses.—Crystalline zinc insulin injection may be used in the treatment of diabetes mellitus when regulation of diet has been unsatisfactory in control of the disease. Because of its chemical purity, solution of zinc insulin crystals is especially indicated for patients who may be expected to exhibit allergic reactions to insulin. Experience has indicated that the occurrence of such reactions may thus be avoided or minimized. Although early clinical observations indicated that the action of crystalline zinc insulin injection as compared with that of insulin may be slightly delayed and somewhat prolonged, further clinical experience has shown, however, that in patients under careful observation crystalline zinc insulin injection and insulin may be used interchangeably.

Dosage.—The potency of crystalline zinc insulin injection is measured in terms of standard units of insulin. The general principles underlying its administration are the same as those covering the use of insulin, and under ordinary circumstances the two solutions may be regarded as interchangeable. The crystalline zinc insulin injection is usually best administered subcutaneously fifteen to thirty minutes before a meal. The time and number of the doses and the amount of solution must be determined by the need of the individual patient, each of whom requires accurate dietary regulation and meticulous clinical study.

Marketed solutions of zinc insulin crystals are water clear and contain from 1.4 to 1.8 per cent w/v of glycerin for isotonicity; 0.1 to 0.25 per cent w/v of phenol or tricresol as a preservative and sufficient 0.01 normal hydrochloric acid to yield a p_H of from 2.5 to 3.5. The biologic activity of the solution is expressed in U. S. P. insulin units per cubic centimeter. Solutions of zinc insulin crystals are stable, provided the storage temperature does not exceed room temperature. Crystalline zinc insulin injection meets the requirements for identity and purity provided in the U. S. P. XII under Injectio Insulini.

CRITERIA FOR EVALUATION OF SKIN DISINFECTANTS

Examination of the literature on skin disinfectants and of the data submitted to the Council in support of such preparations betrays the lack of adequate guiding criteria for the evaluation of surface disinfectants. To aid in clarifying the situation, the Council has declared the advisability of data such as the following in support of any skin disinfectant submitted to the Council for consideration:

1. Phenol coefficients or other in vitro tests in the absence and in the presence of serum, using both vegetative bacterial cells and clostridial spores, with suitable recovery mediums containing, if known, neutralizing substances for the disinfectant being tested.

2. Data on germicidal efficiency under conditions simulating actual use by the method of Price (Price, P. B.: The Bacteriology of Normal Skin: A New Quantitative Test Applied to a Study of the Bacterial Flora and the Disinfectant Action of Mechanical Cleaning, *J. Infect. Dis.* **63**:301 [Nov.-Dec.] 1938; Ethyl Alcohol as a Germicide, *Arch. Surg.* **38**:528 [March] 1939) or, better still, by an extension of the method of Price (Bernstein, L. H. T.: Standardization of Skin Disinfectants, *J. Bacteriol* **43**:50 [Jan.] 1942). The complications due to possible effects of the germicide on the skin itself should be taken into consideration (Cromwell, H. W., and Leffler, Ruth: Evaluation of "Skin Degerming" Agents by a Modification of the Price Method, *ibid.*, p. 51).

3. Data on germicidal efficiency by an animal method, such for example as suggested by Alice H. Kempf and W. J. Nungester (An In Vivo Test for the Evaluation of Skin Disinfectants, *ibid.*, p. 49) or R. W. Sarber (*ibid.*, p. 50).

4. Evidence from animal experiments regarding irritant action on skin and mucosae and regarding systemic toxicity.

5. Critical clinical evidence supporting claims of harmlessness and efficacy.

6. Data on the bacteriostatic activity as distinguished from the germicidal activity of the disinfectant.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

DEXTROSE (See New and Nonofficial Remedies, 1942, p. 418).

The following dosage form has been accepted:

READYFLASK, INC., LAKEWOOD, OHIO.

Dextrose 5% (W/V) in Isotonic Solution of Sodium Chloride: 1,000 cc. Each 100 cc. contains 5 Gm. of dextrose and 0.85 Gm. of sodium chloride-U. S. P.

ISOTONIC SOLUTION OF SODIUM CHLORIDE (See New and Nonofficial Remedies, 1942, p. 425).

The following dosage form has been accepted:

READYFLASK, INC., LAKEWOOD, OHIO.

Isotonic Solution of Sodium Chloride: 1,000 cc. Each 100 cc. contains 0.85 of sodium chloride-U. S. P. in distilled water.

QUININE DIHYDROCHLORIDE (See New and Nonofficial Remedies, 1942, p. 217).

The following dosage forms have been accepted:

ENDO PRODUCTS, INC., RICHMOND HILL, N. Y.

Ampuls Solution Quinine Dihydrochloride: 0.25 Gm. (3¾ grains) in 1 cc.; 0.5 Gm. (7½ grains) in 1 cc.; 1.0 Gm. (15.5 grains) in 2 cc. Each ampul contains the stated amount of quinine dihydrochloride dissolved in distilled water.

TETANUS TOXOID, ALUM PRECIPITATED (See New and Nonofficial Remedies, 1942, p. 516).

The following dosage form has been accepted:

PITMAN-MOORE CO., INDIANAPOLIS.

Tetanus Toxoid (Alum Precipitated): 1 cc. vials in packages of two 1 cc. vials (two immunizing doses) and 10 cc. vial (ten immunizing doses).

PURIFIED SOLUTION OF LIVER (See New and Nonofficial Remedies, 1942, p. 368).

The following dosage forms have been accepted:

JOHN WYETH & BROTHER, INC., PHILADELPHIA.

Purified Solution of Liver, 5 U. S. P. injectable units per cc.: 10 cc. rubber stoppered ampoule. A sterile aqueous solution of liver preserved with 0.5 per cent phenol.

Purified Solution of Liver, 10 U. S. P. injectable units per cc.: 10 cc. rubber stoppered ampoule. A sterile aqueous solution of liver preserved with 0.5 per cent phenol.

ETHYL AMINOBENZOATE (See New and Nonofficial Remedies, 1942, p. 65).

The following dosage form has been accepted:

WINTHROP CHEMICAL CO., INC., NEW YORK.

Anaesthesin Jelly: 1½ oz. collapsible tube.

PENTOTHAL SODIUM (See New and Nonofficial Remedies, 1942, p. 463).

The following dosage form has been accepted:

ABBOTT LABORATORIES, NORTH CHICAGO, ILL.

Ampoules Pentothal Sodium: 5.0 Gm. with 0.3 Gm. anhydrous sodium carbonate as a buffer. Multiple dose ampul.

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1942, p. 555).

The following dosage form has been accepted:

LAKESIDE LABORATORIES, INC., MILWAUKEE.

Solution Thiamine Hydrochloride, 100 mg. per cc.: 15 cc. vial. Preserved with 0.5 per cent of chlorobutanol.

PYRIDOXINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1942, p. 563).

The following dosage forms have been accepted:

THE LAKESIDE LABORATORIES, INC., MILWAUKEE.

Ampuls Pyridoxine Hydrochloride, 50 mg. per cc.: 1 cc.

Pyridoxine Hydrochloride, 50 mg. per cc.: 5 cc. vial.

Tablets Pyridoxine Hydrochloride: 5 mg.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 20, 1943

ANTIBODY FUNCTION OF LYMPH NODES

For fifty years it has seemed logical to immunologists to assume that specific antibodies are formed as internal secretions by certain fixed tissues. Attempts to determine the essential immunologic endocrines, however, were unsuccessful. Hektoen and his co-workers [1] found that removal of the stomach, small intestine, pancreas, thyroid, spleen and other organs whose surgical removal is compatible with life does not materially reduce the power of the remaining tissues to produce specific opsonins and agglutinins. From this failure they concluded that the antibody producing tissues must be widely distributed throughout all organs, and they directed attention particularly to the capillary endotheliums as the most probable tissue. Support was given to this theory by physical or chemical reticuloendothelial blockade, both stimulation of specific precipitin production [2] and almost complete suppression of production [3] being reported as a result of minimal or maximal blockade with such agents as india ink, carmine particles or colloidal dyes. The alleged production of specific hemolysins in certain reticuloendothelial tissue cultures [4] and their reduced production in animals in which the reticuloendothelial system has been greatly reduced in volume by exposure to x-rays [5] support this conclusion.

As early as 1898, however, Pfeiffer [6] had directed attention to lymphatic tissues as the probable source of antibodies. He titrated the bacteriolysins in various organs of rabbits previously injected intravenously with nonviable bacterial vaccines and at times found these antibodies in higher concentration in the spleen than in the blood stream. This, however, was not generally considered proof of local specific antibody formation, since similar splenic concentrations were noted in rabbits passively immunized by serum transfer. McMaster and others,[7] however, have recently strengthened the evidence, having shown that in mice local histologic reactions in regional lymph glands are associated with a definite increase in local specific agglutinins, the local titer at times reacting two to four times that of the blood serum.

A crucial test of the lymph gland theory of specific antibody production has now been reported by Ehrich and Harris [8] of the department of pathology of the University of Pennsylvania School of Medicine. The Pennsylvania pathologists selected the popliteal lymph node of rabbits as offering a unique opportunity for such study. This gland is the only lymph node draining the hind foot and is supplied with afferent and efferent lymphatics of sufficient size for convenient aspiration. With a tuberculin syringe they could readily collect from 0.2 to 0.6 cc. of lymph from each vessel, amounts sufficient for antibody titration. Ehrich and Harris therefore injected suspensions of formed antigens, such as heat killed bacilli or washed erythrocytes, into the plantar surface of the left hind foot. At various intervals after this injection they aspirated lymph from both the afferent and efferent lymphatics of the left popliteal gland, with simultaneous titrations of the blood serum, of aqueous extracts of the popliteal gland and of subcutaneous tissues of the injected hind foot. Controls were run with homologous products from the opposite or noninjected leg, or from control leg tissues injected with a heterologous antigen (e. g., egg white).

In all cases the agglutinin or hemolysin titer was higher in the efferent than in the afferent lymph of the injected popliteal gland. Difference was not noted between the afferent and efferent lymph of the control noninjected popliteal space. After passage through the vaccinated lymph node the antibody titer was often increased as much as a hundredfold to a titer often exceeding that of the blood serum. Extracts of the injected foot tissues usually showed titers as low as the titer of the afferent popliteal lymph. The titer of popliteal node extracts was often from two to ten times higher than that of the blood serum, the control popliteal gland showing only traces of specific antibodies.

From this and other evidence Ehrich and Harris conclude that both hemolysins and agglutinins are formed within regional lymph nodes. They found that antibodies began to appear in the regional nodes from two to four days after plantar injection and reached their highest concentration by the sixth day. Local antibody formation was preceded and accompanied by local

1. Hektoen, Ludvig, and Curtis, A. R.: J. Infect. Dis. **17**: 409, 1915.
2. Standenorth, G.: Ztschr. f. Immunitätsforsch. **38**: 19, 1923.
3. Gay, F. P., and Clark, Ada R.: The Reticuloendothelial System in Relation to Antibody Formation, J. A. M. A. **83**: 1296 (Oct. 25) 1924.
4. Carrel, Alexis, and Ingebrigsten, R.: J. Exper. Med. **15**: 287, 1912.
5. Hektoen, Ludvig: J. Infect. Dis. **17**: 419, 1915.
6. Pfeiffer, R., and Marx: Ztschr. f. Hyg. **27**: 272, 1898.
7. McMaster, P. D., and Hudack, S. S.: J. Exper. Med. **61**: 783 (June) 1935.
8. Ehrich, W. E., and Harris, T. N.: J. Exper. Med. **76**: 335 (Oct.) 1942.

hyperplasia. The local tissue proliferation was chiefly of the lymphatic type, from which they concluded that the lymphocytes are the major (or perhaps the only) local cells responsible for antibody synthesis.

CALIFORNIA PHYSICIANS' SERVICE AND HENRY KAISER'S PERMANENTE FOUNDATION

The hearings before the Pepper subcommittee reported in THE JOURNAL have made physicians familiar with the problems related to the provision of medical service created when Mr. Henry Kaiser undertook to provide for the employees of his various interests in California, Oregon and Washington. The January issue of *California and Western Medicine* publishes some information as to the present status of this situation in California. There are about 87,000 employees in the Richmond yards. The plan in operation provides for a 50 cent weekly payroll deduction for the provision of complete medical care and hospitalization to Kaiser employees who are injured or who may be taken ill from nonindustrial causes. The plan now covers 52,000 employees who have consented to the deduction. To these employees are available the facilities of the Maritime Commission's field hospital and six first aid stations, also the services of a staff of some fifty physicians and a 78 bed hospital in Oakland. This hospital was an old hospital named the Fabiola Hospital, which was purchased, rebuilt and renovated with the sum of $500,000 loaned by Mr. and Mrs. Henry Kaiser under the name of the Permanente Foundation. An additional wing of 75 beds is being added to the original 78 beds.

The income of the plan, it is reported, is designed to meet current expenses and to amortize the loan of $500,000 from Mr. and Mrs. Kaiser. Several commercial insurance carriers handle industrial accident liabilities in the plant. The industrial medical fees paid by the insurance companies also accrue to the foundation. The Permanente Foundation is a nonprofit venture. When the $500,000 advanced by Mr. and Mrs. Kaiser has been repaid in full, further profits are to be used for the promotion of medical research, for the rehabilitation of disabled physicians, for the endowment of hospital beds and for the teaching of industrial medicine. The plan is administered by Dr. Sidney R. Garfield under an agreement which allows him to draw up to $25,000 annually in salary. A statement by Dr. Garfield, according to *California and Western Medicine,* indicates that thus far he has not drawn any salary from the funds of the foundation but has, in fact, put into current operating funds some $10,500 of his own money, with the understanding that this also is to be repaid from the funds that accrue in the future. The statement in *California and Western Medicine* indicates that the facilities and the quality of the medical service provided are excellent.

One of the chief questions raised before the Pepper hearings concerned the relationships of the Procurement and Assignment Service to the medical care plan of Mr. Kaiser. On this subject *California and Western Medicine* says:

> Early in its existence in California, Procurement and Assignment Service became aware of the building up by Mr. Kaiser and Dr. Garfield of a staff of physicians for both the industrial and nonindustrial medical care of Kaiser employees. The Kaiser staff of some thirty physicians (early in 1942) represented a group of young men, all but two of whom were definitely of military age.
>
> A review of the Kaiser medical staff showed that practically every one of the thirty physicians should be declared "available for military service" because of his age; at the same time, Procurement and Assignment Service had no intention or desire to break up an established staff which was caring for an important segment of the industrial population.
>
> Complaints had been heard from the medical profession that the Kaiser staff was practicing "corporate medicine," that Dr. Garfield had resorted to "piracy" in hiring his physicians, that the whole operation was an unethical one, that doctors eligible for military service were being offered sanctuary and protection from Selective Service. Procurement and Assignment Service took the attitude, however, that its function had nothing to do with ethics and that its approach to the problem must be from the point of view of the distribution of physicians between military and civilian agencies.
>
> At the same time, Procurement and Assignment Service put Dr. Garfield on notice that his staff members were vulnerable to induction into the Army by Selective Service because of their low average age. This warning was given for the protection of the staff, to obviate the disruption that might occur if a large part of the staff was classified 1-A by local draft boards and forced into military service.
>
> On the basis of the above reasoning, a program was worked out whereby Dr. Garfield would clear through Procurement and Assignment Service any physicians who were under consideration for employment on his staff. It was understood that those physicians who otherwise would be available for military service were not to be employed by Dr. Garfield except for a temporary period, while they awaited the issuance of their commissions and orders for active duty.
>
> A second part of this program called for the replacement of any four young staff members every ninety days; replacements were to be by physicians over military age or physically disqualified and rejected for military service. Procurement and Assignment Service agreed, under this program, to declare "essential" the remaining members of the Garfield staff until the time for replacement of each staff member should come up.
>
> This program was put into operation. Procurement and Assignment Service has referred to Dr. Garfield no less than twenty-five physicians who are either too old for military service or have been rejected by the Army. Some of these have been acceptable to Dr. Garfield and have been employed by him; some have been unable to perform the medical duties with satisfaction. Nine of the former members of the Garfield staff have been accepted for military duty and have been replaced by other physicians. The program is somewhat behind schedule at present because Dr. Garfield found it necessary shortly after the start of the program to increase his staff to care for the increasing number of employees who have signed up for the plan, and to cover the expanding program of the shipyards.

The California Physicians' Service, a nonprofit medical care organization sponsored by the California Medical Association, has also undertaken the health care of wartime industrial employees in shipyards and

other areas on an area basis. Outside the industrial plants its services are provided to employees and their families who reside in Federal Housing Authority projects which have been built around the industrial plants. The California Physicians' Service operates a medical center in each of the housing areas that it serves. The staff physicians and nurses in the medical centers give immediate care to the industrial employees and their families and refer to members of the California Physicians' Service in the immediate vicinity cases which require hospitalization, surgery or more extensive medical care. The Federal Public Housing Authority adds the monthly charge for California Physicians' Service to the rental of the housing unit and turns the collections over to the California Physicians' Service. Under this arrangement any profit that may accrue must be returned to the subscribing employees and their families in the form of either reduced fees or increased services. The cost of hospitalization is included in the California Physicians' Service fee.

Among questions not yet determined are (1) the extent to which the Permanente Foundation plan will be expanded to care for families of employees; (2) whether or not the Garfield plan will be expanded to include care of employees living outside the service area of the hospital in Oakland: one San Francisco physician has already been employed to make house calls; (3) the extent to which the Permanente Foundation and the California Physicians' Service may work out a cooperative plan; (4) the financial arrangements involved when an employee finds that by living in a Federal Housing Authority housing project he is entitled to medical care both from the Permanente Foundation and from the California Physicians' Service plan.

Readers of THE JOURNAL will remember that physicians in Oregon worked out arrangements satisfactorily for the Kaiser employees near Portland. It should be remembered, however, that the chief question at issue in the Pepper hearings was the utilization of medical manpower and the desire of the Kaiser organization to retain the young physicians in its hospitals whereas the Procurement and Assignment Service had designated them as eligible for service with the armed forces. It will be observed that nine of these physicians are now with the armed forces. The alleged opposition of the medical societies of the states concerned to prepayment plans for medical service seems to have been introduced into the discussion for the one purpose of prejudicing public opinion on the other issue. The manner in which California Physicians' Service has been cooperating with other agencies in supplying medical care in the emergency that prevails is in itself proof of the lack of validity associated with introducing that point in the hearings.

FIBRINOGEN EMBOLI FROM SUPERFICIAL BURNS

A timely addition to our knowledge of the pathology of superficial burns has been made in a study of the toxicity of heated human plasma recently reported by Kabat and Levine[1] of the Department of Physiology, University of Minnesota. In the course of extensive experiments on thermal shock in anesthetized cats it was noted that a small proportion of the animals succumbed within a few minutes after burning. The respiration stopped suddenly, the heart beat was slow and irregular and the blood pressure fell precipitously. Artificial respiration usually did not result in recovery. Hemoconcentration was minimal at the time of death. Since the sudden death could not be explained on the basis of fluid loss and since nervous factors had been experimentally eliminated, the phenomenon was attributed to a toxin.

Measurements of subcutaneous temperatures in experimental scalds showed that temperatures of 55 to 65 C. are reached and maintained for several minutes. Citrated cat blood was therefore heated to 65 C. for one minute and from 3 to 4 cc. of this heated blood injected intravenously into the same animal. The respiration ceased within two minutes. The heart continued to beat for five minutes. Artificial respiration was without avail. Rapid death was also observed following intravenous injection of 2 cc. of heated autogenous plasma. Intravenous injection of heated serum even in much larger amounts was without toxic effects. The supernatant of centrifuged heated plasma also was nontoxic. This suggests that the fine precipitate formed in the heated plasma is the toxic agent. The precipitate is presumably partially denatured fibrinogen.

Evidence indicates that the particle size rather than the chemical constitution of this precipitate determines its toxicity, since heated plasma can be rendered innocuous by simple homogenization in an apparatus capable of breaking up tissue cells. As much as 40 cc. of homogenized heated plasma can be injected without appreciable toxic reaction. Evidence also indicates that the rate of injection rather than the volume injected determines toxicity. In one experiment, for example, 13 cc. of heated plasma was injected slowly without producing rapid death. The injected cat survived for four days, during which time it was very weak and made almost no spontaneous movements. Necropsy showed a perforating gastric ulcer 1 cm. in diameter.

To test possible applications to human medicine a similar study was made of the effects of intravenous injections of heated human plasma into unanesthetized rabbits. Human plasma heated to 56 to 65 C. showed the same type of precipitate as that observed with heated cat plasma, while precipitate was not formed in heated human serum. Rapid injection of 2 to 5 cc.

1. Kabat, Herman, and Levine, Milton: Science **96**: 476 (Nov. 20) 1942.

of heated human plasma into the ear vein of a normal rabbit resulted in prompt respiratory arrest, death taking place in from five to ten minutes. The centrifuged precipitate of the heated plasma gave the same toxic reaction, while the plasma supernate was nontoxic. Also the precipitate in heated human plasma could be rendered nontoxic by homogenization. Here also it is presumably the particle size rather than chemical composition that determines toxicity. Microscopic examination of the lungs of rabbits which died from injection of heated human plasma revealed widespread and numerous capillary protein thrombi.

The possibility that capillary emboli may play an important part in the pathology of severe burns was suggested by earlier investigators. Frankel,[2] Bardeen [3] and others, for example, noted minute capillary thrombi in the liver, spleen and kidneys in cases of burns, while Billroth [4] had previously supported the embolic theory of Curling's ulcer. Salvioli,[5] Vaccarezza [6] and others found that canine blood became hypocoagulable following severe burns and that previous defibrination of the blood rendered the dogs more resistant to lethal burns.

Determination of the exact chemical composition of the toxic "fibrinogen precipitate" must precede any attempts at logical therapy.

2. Frankel, E.: Deutsche med. Wchnschr. **15**: 22, 1889.
3. Bardeen, C. R.: Bull Johns Hopkins Hosp. **7**: 137, 1898.
4. Billroth, Theodor: Wien. med. Wchnschr. **17**: 705, 1867.
5. Salvioli, J.: Virchows Arch. f. path. Anat. **125**: 364, 1891.
6. Vaccarezza, R. A.: Comp. rend. Soc. de biol. **86**: 1114, 1922.

1. Faxon, N. W., and Churchill, E. D.: The Cocoanut Grove Disaster in Boston, J. A. M. A. **120**: 1385 (Dec. 26) 1942.
2. Moulton, R. S.: The Cocoanut Grove Night Club Fire, National Fire Protection Association, Jan. 11, 1943.

Current Comment

THE COCOANUT GROVE FIRE

The Cocoanut Grove night club fire in Boston on Nov. 28, 1942, in these days, each of which brings some new tale of conflict or disaster, now seems like ancient history. Some of the medical aspects of that disaster were discussed in THE JOURNAL.[1] A preliminary report by Moulton,[2] technical secretary of the National Fire Protection Association, indicates that the lessons of that disaster will not be lost. The onset and course of the fire, the structural features and design of the property, fire fighting operations, activities of emergency organizations and the factors which contributed to the immensity of the disaster are fully described. Most of the victims died from burns and inhalation of smoke and flame. The statement of Dr. Watters, associate medical examiner of the Southern Suffolk District, says he remembered only one broken bone—a rib—in the hundreds of bodies he examined; apparently people died too quickly to fight for their lives. The victims seem to have been overcome by something more than carbon monoxide. The report reviews the different theories which have been proposed to explain the rapid spread of the fire and to account for the fumes described by survivors as acrid but not identified. Fire experience all too clearly shows that the fear of being burned to death or suffocated, the rush of smoke and hot gases and the sight of spreading flame completely alter the pattern of logical human behavior and produce panic. In this disaster as in others panic unquestionably played a large part in the number of fatalities. The activities of emergency organizations were on the whole satisfactory, although they demonstrated one serious fault: there was no apparent central authority in charge at the fire. The club was poorly provided with exits: many exits were completely obscured by false walls; doors were kept locked; revolving doors jammed as usual and behind these two hundred bodies were found; even those exits which were available were not all clearly marked. At the close of its term the Grand Jury then in session voted ten criminal indictments with the possibility of more to come. What emerges from this report in particularly bold relief is the ease with which this great loss of life could have been entirely avoided.

NEW OPPORTUNITIES IN HEALTH EDUCATION

Last week an announcement of fellowship made available by the W. K. Kellogg Foundation, through the United States Public Health Service, for training personnel in health education was published in THE JOURNAL, page 525. This training will take place at the University of North Carolina at Chapel Hill beginning March 20, 1943 and be completed in March 1944. This action is based, according to a communication from the United States Public Health Service,[1] on the tremendous demand for well qualified health education personnel needed in local and state health departments.[2] This opportunity for training in public health education should be welcomed by interested physicians or educators. The field of health education has long lacked physicians who can teach or teachers with an adequate background of the medical sciences. Out of training such as this teachers with the necessary basic qualifications should be developed. There will be an increased demand for them after the cessation of hostilities not only in the United States but presumably elsewhere. In this connection attention is called to the action of the Trustees of the American Medical Association in providing a short refresher course in health education at the headquarters of the American Medical Association under the direction of the Bureau of Health Education. Qualified applicants may register for two weeks' observation, demonstration and participation in the health education work of the American Medical Association. No tuition or fees are involved, but the applicant is expected to defray his own expenses. Full information may be had from the Bureau of Health Education.

1. Letter of Jan. 23, 1943 to Bureau of Health Education from E. R. Coffey, Assistant Surgeon General, Division of Sanitary Reports and Statistics, U. S. Public Health Service.
2. Candidates will present a background of basic cultural education, basic sciences including physics, chemistry, biology, physiology and bacteriology, training in education and educational psychology and social science education. The minimum educational qualifications will be a Bachelor of Science degree, or its equivalent, with major emphasis on basic medical sciences, education or the social sciences. These fellowships are open to American citizens between the ages of 19 and 40 inclusive. A stipend of $100 per month for twelve months plus tuition fees and travel for three months of field experience will be allowed. The applicant, however, must pay his own travel to and from the university at the beginning and end of training. Application blanks may be had from the United States Public Health Service, Security Administration, Washington, D. C.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession.

ARMY

EPIDEMIC KERATOCONJUNCTIVITIS

Circular Letter No. 14 of the Office of the Surgeon General is concerned with the treatment of epidemic keratoconjunctivitis. It was issued on January 11 to all medical officers of the United States Army. The suggestions which follow are therefore recommended as routine in the army medical service:

1. The purpose of this circular letter is to bring to the attention of medical officers an inflammatory disease of the eye which has recently been given the descriptive name of epidemic keratoconjunctivitis. It is called also virus conjunctivitis and keratitis maculosa. The disease resembles superficial punctate keratitis, keratitis nummularis and keratitis subepithelialis. Although this disease is not new, having been reported since 1890 in Austria, Germany, India and the Orient, its recent spread is of importance to the Army and to industrial plants engaged in work for the Army.

2. During the summer of 1941 an outbreak of this acute inflammatory eye disease occurred in the Hawaiian Islands among shipyard workers and subsequently spread to members of the armed forces and civilians in the adjacent areas. A spread to the mainland followed in September 1941, the first cases being noted in shipbuilding plants in the San Francisco region. In October 1941 cases were seen in Oregon, again among workers in shipyards. The peak of this West Coast epidemic was reached in January 1942. Recently cases have appeared in epidemic proportions in industrial plants in the Eastern United States.

3. The etiology of epidemic keratoconjunctivitis is unknown, although evidence at present points to a filtrable virus as the causative agent. The disease probably is transmitted to susceptible persons by direct and indirect contact, such as touching the eye with a contaminated hand or towel. The presence in the immediate surroundings of noxious gases, fine particles of metal or dust or other substances irritating to the eyes may enhance susceptibility. The incubation period is from five to twelve days with the onset of the majority of cases on or about the eighth day after exposure. The disease is limited to one eye in about 75 per cent of cases. The involvement of the other eye, when it occurs, is usually less severe.

4. The initial symptoms are those of acute follicular conjunctivitis. In many cases the onset is sudden and severe. The conjunctivitis is characterized by "sandy feeling," as if a foreign body were present. Examination of the eye at this time discloses an extremely conjested and chemotic conjunctiva, rather glassy in appearance, with sometimes concomitant edema of one or both lids, particularly the upper. Petechial or larger conjunctival hemorrhage may occur. The conjunctivitis persists about two weeks. There is no discharge, although a transient pseudomembrane may appear on the palpebral conjunctivas and caruncle. Systemic symptoms composed of headache and malaise occur shortly after the onset of the conjunctivitis in from 25 to 50 per cent of the cases. The headache, a moderately severe, dull, aching pain over the frontal or occipital region, lasts two to three days and is apparently unrelieved by analgesics in most cases. It frequently prevents sleep and is often described as a "night pain." The malaise, when it occurs, varies in intensity with the severity of the conjunctivitis in most instances and is described as "not feeling well" or as having an "achy feeling." A preauricular adenitis appears in about 75 per cent of the cases thirty-six to forty-eight hours after the onset of the conjunctivitis. The nodes usually measure 1 to 2 cm. in diameter, are tender and may remain enlarged from one week to several months. A keratitis appears about one week following the first symptoms of the conjunctivitis. This is characterized by sudden pain, photophobia, lacrimation and blepharospasm. Close inspection of the eye at this time reveals several dotlike opacities in the cornea. These gradually become larger and coalesce to form small round opacities from 0.5 to 1.5 mm. in diameter. The symptoms due to the onset of the keratitis usually last about one week but in some cases persist for two to six weeks. With the appearance of the keratitis the visual acuity is definitely diminished. Patients sometimes complain of seeing halos around objects. Precision work at this time is almost always impossible. A 20/30 vision is usually regained in some three to six weeks and the ultimate prognosis as to vision is good. The disease is self limited, usually lasting from one to three months but sometimes much longer. The corneal opacities do not ulcerate, gradually diminish in size, and in most instances finally disappear. In some severe cases, however, damage to the cornea causes permanent impairment of vision.

5. Beal's acute follicular conjunctivitis, inclusion body conjunctivitis and acute trachoma are among the conditions to be considered in the differential diagnosis. There is no way of differentiating Beal's conjunctivitis with certainty early in the course of the disease, but in Beal's conjunctivitis the cornea is never involved and the preauricular adenitis is not pronounced. The diagnosis of both inclusion body conjunctivitis and trachoma can be established by the demonstration of inclusion bodies in the conjunctival scrapings. The preauricular glands are almost never involved in either, and both respond readily to sulfonamide therapy. In addition, the cornea is not involved in inclusion body conjunctivitis and in trachoma exhibits pannus formation. Other types of conjunctivitis to be considered in the differential diagnosis are acute catarrhal conjunctivitis, gonococcic ophthalmia, Parinaud's conjunctivitis, tularemia, tuberculosis lymphogranuloma and streptococcic membranous conjunctivitis.

6. The treatment of keratoconjunctivitis is wholly palliative. Cold compresses afford more relief than does heat. The eyes should not be bandaged. Protection from the light by smoked or darkly tinted glasses is desirable. There is no specific therapy.

7. The early recognition and prevention of spread of this disease in army posts and stations are particularly important because of its high noneffective rate. Precautionary measures which should be carried out consist in: (1) Isolation of the patient during the acute stage of the disease, if practicable. Patients should have no access to towels, soap or washstands used by others. Where a small number of cases occurs, strict isolation is desirable. (2) Careful supervision of patients with irritated eyes, chalazions and traumatic lesions of the eyes which render them more susceptible to keratoconjunctivitis. (3) Advice to the patients that this disease may be transmitted by hands, towels, handkerchiefs and other fomites that have been in contact with the infected eye. (4) Thorough washing of the hands after examination of a suspected patient and before examination of other patients. (5) Sterilization of solutions, eye droppers and instruments used in eye cases. It is particularly important for the responsible medical officer to see that the fourth and fifth precautionary measures just mentioned are observed, since the dispensary can become the focus for the distribution of keratoconjunctivitis to patients who otherwise would not be exposed.

8. It should be noted also that typical cases may be present not only during an epidemic but also during the period preceding an explosive outbreak of the disease. Therefore particular attention should be paid to unusual cases of conjunctivitis that do not fall into any well known categories.

ASHFORD GENERAL HOSPITAL AT WHITE SULPHUR SPRINGS

The War Department on Sept. 29, 1942, acquired the Greenbrier Hotel, White Sulphur Springs, W. Va., and has designated it as the Ashford General Hospital in honor of the late Col. Bailey K. Ashford of the Medical Corps.

The hospital, which ultimately will have a 2,000 bed capacity, will provide all forms of medical and surgical care. The commanding officer is Col. Clyde M. Beck, Medical Corps, and the executive officer Lieut. Col. Sam F. Seeley, Medical Corps, who until recently was executive officer of the Procurement and Assignment Service, War Manpower Commission. While still in process of development, the hospital is already caring for several hundred patients. The staff when complete will represent the best in medicine, surgery and the specialties. The members now on duty are as follows:

Lieut. Col. Daniel C. Elkin, M. C., Whitehead professor of surgery and Surgeon in chief, Emory University Hospitals, Atlanta, Ga.

Major James M. Brown, M. C., formerly registrar, Station Hospital, Camp Robinson, Arkansas.

Major Cecil B. Hert, M. C., instructor in otolaryngology, University of Rochester, surgeon to Strong Memorial Hospital, chief bronchoscopist, Rochester General Hospital, Rochester, N. Y.

Major Robert A. Kilduffe, M. C., director, Laboratories, Atlantic City Hospital, city bacteriologist, city of Atlantic City, N. J.

Major R. H. Kunstadter, M. C., associate attending pediatrician and chief of Child-Endocrine Clinic, Michael Reese Hospital, Chicago.

Major T. W. Maloney, M. C., chief, electrocardiographic department, Geneva General Hospital, Geneva, N. Y.

Major John M. Masters, M. C., ophthalmologist, Indiana University Hospitals, Indianapolis.

Major Marsh H. McCall, M. C., clinical instructor in medicine, Cornell University Medical College; associate attending physician, Bellevue Hospital, New York.

Major R. C. Pendergrass, M. C., radiologist, former instructor of radiology, Emory University, director of Americus Tumor Clinic, Atlanta, Ga.

Major John W. Pennock, M. C., associate professor of medicine, Syracuse University Medical School; director, metabolism department, St. Joseph's Hospital, Syracuse, N. Y.

Major George H. Prather, M. C., instructor in genitourinary surgery, Harvard Medical School; visiting urologist, Boston City Hospital, Boston.

Major Barnes Woodhall, M. C., associate professor of surgery, Duke University School of Medicine, Durham, N. C.

Captain M. L. Barnes, M. C., instructor in pathology, University of Louisville Medical School, Louisville, Ky.

Captain Frank L. Bauer, M. C., house officer, Massachusetts General Hospital; fellow, Rockefeller Foundation, Boston.

Captain Jack Chesney, M. C., chief, Tennessee Health Department Pediatric Clinic, Knoxville; attending pediatrician, Knoxville General Hospital, Knoxville, Tenn.

Capt. Lee J. Croll, M. C., associate attending ophthalmologist, Grace Hospital, Detroit.

Captain W. H. Harken, M. C., assistant in surgery, Harvard Medical School, Boston.

Captain M. H. Harris, M. C., Whitehead Fellow in Surgery, Emory University, Atlanta, Ga.

Capt. John H. Iselin Jr., M. C., assistant attending physician, First Medical Division, Bellevue Hospital, New York.

Capt. Robert P. Kelly, M. C., assistant in orthopedics, Walter Reed Hospital; residents in orthopedics, Louisville City Hospital, Louisville, Ky.

Capt. Samuel B. Kirkwood, M. C., instructor in obstetrics and maternal health, Harvard Medical School; chief of staff, Florence Crittenton Maternity Hospital, Boston.

Capt. Milton L. Kramer, M. C., instructor in Medicine, Cornell University Medical College; associate physician, Beth Israel Hospital and Hospital for Joint Diseases, New York.

Capt. E. N. Pleasants, M. C., chief, Department of Shock Therapy, New Jersey State Hospital, Marlboro, N. J.

1st Lieut. Leonard B. Ainsworth, M. C., surgical staff, Lawrence General Hospital, Lawrence, Mass.

1st Lieut. Russel E. Carlson, M. C., attending surgeon, Lakeview Memorial Hospital, Stillwater, Minn.

1st Lieut. John B. Claffy, M. C., assistant in surgery, Misericordia and Fitzgerald-Mercy Hospitals, Philadelphia.

1st Lieut. Fred Cooper, M. C., instructor in surgery and resident surgeon, Emory University School of Medicine, Atlanta, Ga.

1st Lieut. L. T. Corum, M. C., resident in pediatrics, Grady Hospital, Atlanta, Ga.

1st Lieut. H. L. Dorfmann, M. C., associate physician, Gouverneur Hospital, New York; associate physician, Stuyvesant Polyclinic; clinical assistant, chest, Mount Sinai Hospital.

1st Lieut. William H. Galvin Jr., M. C., resident anesthetist, St. Luke's Hospital, New York; chief anesthetist, North County Community Hospital, Glen Cove, L. I.

1st Lieut. John J. McGehee, M. C., surgical staff, Hall-Chaudron Hospital, Cedartown, Ga., and McCall Hospital, Rome, Ga.

1st Lieut. Joseph Post, M. C., instructor in medicine, Columbia University College of Physicians and Surgeons, New York.

1st Lieut. Paul Rieth, M. C., resident in orthopedics, Indiana University School of Medicine, Indianapolis.

1st Lieut. Louis M. Rosati, M. C., clinical assistant in surgery, New York Polyclinic and Gouverneur Hospitals, New York.

1st Lieut. Leo M. Traub, M. C., resident in psychiatry, Stanford University Hospital, San Francisco.

1st Lieut. J. L. Weinberger, M. C., staff physician and resident in psychiatry, Worcester State Hospital, Worcester, Mass.

Bailey Kelley Ashford, to whose record of achievement this hospital will be a monument, was born in Washington, D. C., Sept. 18, 1873. His father, as professor of surgery in Georgetown University Medical School at the time of the assassination of President Garfield, was among those called in attendance. Bailey Ashford entered the Army Medical Corps in 1897, and joined the expeditionary forces of the army of occupation sent to Puerto Rico in 1898. When Dr. Ashford was stationed at Ponce in 1899 a hurricane wrought such havoc that for nearly a year the care of nearly 800,000 of the native population was assumed by the army. His hospital wards were filled with pallid and emaciated refugees and he promptly recognized the significance of the eosinophilia present. He found a new species of ova in the feces and recognized their relation to the anemia and malnutrition common to the inhabitants of the islands. On Nov. 24, 1899 he reported in a historic telegram his discovery that the cause of "Porto Rican anemia" was infestation with an intestinal parasite later to be named Necator americanus. When the Superior Board of Health in 1900 issued a pamphlet on "Porto Rican anemia," the etiologic significance of uncinariasis was recognized as an important medical discovery. In 1904 the Puerto Rican government provided funds for the study and treatment of anemia and authorized the establishment of the Puerto Rican Anemia Commission.

Colonel Ashford early proposed the establishment of a School of Tropical Medicine in Puerto Rico, and in 1936 he established the School of Tropical Medicine of the University of Puerto Rico under the auspices of Columbia University, in which he served as professor of mycology and tropical medicine.

Colonel Ashford also carried on an investigation of sprue; he was a member of a commission sent to Brazil to investigate an epidemic finally shown to be a combination of malaria and dengue, and in 1910 was a delegate to the International Congress of Industrial Hygiene and Alimentary Hygiene in Brussels. In 1917 he sailed with the First Division for France and later became chief surgeon of the Sixth Army Corps. After the war he was transferred to the general staff in Washington and was made editor in chief of the Official Medical History of the War. Many honors were awarded him: the Distinguished Service Medal; the Order of St. Michael and St. George of England; the Order of the Nile of Egypt; Doctor of Science from the Universities of Georgetown, Columbia, Egypt and Puerto Rico; these were but a few. On Nov. 1, 1934 his distinguished career ended. His body lies in the military cemetery at San Juan. It is fitting that this great hospital at White Sulphur Springs be named after a great and humble man who spent his life in the service of his fellow men.

THE TRAINING OF ARMY LABORATORY OFFICERS

Twenty-four army medical officers, captains and first lieutenants comprise the second group to be assigned to the University of Chicago for intensive training in laboratory methods to equip these officers to take charge of laboratories. The University of Chicago student officers are given forty-four hours of instruction a week for twelve weeks in bacteriology, biochemistry, hematology, parasitology, pathology, serology and tropical medicine. The course is under the direction of Dr. R. Wendell Harrison, assistant dean of the Division of Biological Sciences, who is assisted by twelve members of the scientific faculty of the university. Similar work in laboratory methods is given at nine other universities.

LOYOLA HOSPITAL UNIT ON ACTIVE DUTY

About fifty-one members of the faculty of Loyola University School of Medicine, Chicago, recently left for New Orleans for several weeks' intensive training as members of the staff of U. S. Army Base Hospital No. 108, which is sponsored by the Loyola University School of Medicine and organized under the supervision of Col. George T. Jordan, head of the eye, ear, nose and throat department of the medical school and a veteran of the first world war. Colonel Jordan, who has been in command of the unit for many years, has been retired as commanding officer on account of the age limit. The head of the medical section of the 108th Base Hospital is Lieut. Col. Stanley Fahlstrom, and of the surgical section Lieut. Col. William J. Vynalek. The personnel when fully assembled will comprise about 155 doctors and nurses and 500 enlisted men of the medical department. Others who have been assigned to this unit are:

MAJORS

Ellis Bonnell, Champaign, Ill.
Herman F. DeFeo, Chicago
Angelo S. Geraci, Chicago
Julius M. Glasser, Chicago
C. H. Grandstaff, Washington, D. C., Dental Corps
Paul Headland, Chicago
S. L. Governale, Chicago
M. M. Hipskind, Chicago
Alfred C. Ledoux, Evanston, Ill.
R. R. Martin, Peoria, Ill.
Donald Miller, Chicago
Howard Miller, Peoria, Ill.
Benjamin H. Neiman, Oak Park, Ill.
A. V. Partipilo, Camp Carson, Colo.

CAPTAINS

Paul K. Anthony, A. M. C., Washington, D. C.
Peter Bianco, Peoria, Ill.
R. Norton Bolman, Fort Wayne, Ind.
J. Morrison Brady, Chicago
Richard H. Callahan, East Chicago, Ind.
J. P. Cascino, Chicago
Nathan Falk, Chicago
Thomas A. Howland, Chicago, Dental Corps
Harry J. Kazen, Chicago, Dental Corps
Arno Leshin, A. M. C., Washington, D. C.
Martin J. McCarthy, Chicago
Hugh O'Hare, Corry, Pa.
George Perkins, Chicago
Francis A. Reed, Glenview, Ill.
Paul Rosenfels, Chicago
John W. O'Connor, Peoria, Ill.

FIRST LIEUTENANTS

Joseph A. Bertucci, Chicago
Frank Blair, Chicago, Dental Corps
Donald Boles, Camp Carson, Colo.
John B. Condon, Chicago
Robert J. Freedman, Chicago
Charles J. Caul, Camp Carson, Colo.
John B. Hoesley, A. M. C., Washington, D. C.
Charles F. Kramer, Camp Crowder, Mo.
Frank W. Newell, Chicago
A. G. Rink, Chicago
Rocco V. Serritella, Chicago
William J. Tighe, A. M. C., Washington, D. C.

MAYO CLINIC PROVIDES TRAINING FOR MILITARY OFFICERS

During the current quarter one hundred and forty medical and dental officers of the Army, Navy, Public Health Service and the Air Forces are assigned through the Surgeon General's Offices and the various service commands for training under the auspices of the Mayo Foundation for Medical Education and Research. The fields in which such training is offered are anesthesiology, aviation medicine, general surgery and surgical specialties, internal medicine and medical specialties, maxillofacial surgery, neurologic surgery, physical medicine, roentgenology and thoracic surgery. Officers are assigned for periods of training varying from six to twelve weeks.

DEHYDRATED FOODS COOKBOOK

A cookbook dealing exclusively with the preparation of dehydrated foods has been published, the War Department announced on February 4, for the use of army cooks, and will not be available to the public at present. The Quartermaster General, the Quartermaster Corps Subsistence Research Laboratory in Chicago and commercial organizations which have pioneered in the dehydration of foods collaborated in producing the manual, which contains recipes for cooking dehydrated apples, beets, cabbage, carrots, white potatoes, sweet potatoes, rutabagas and eggs, and also recipes for pies, cakes and puddings using dehydrated foods as ingredients. Quartermaster Corps subsistence experts state that dishes prepared according to directions from satisfactory dehydrated foods usually cannot be distinguished from those prepared from fresh materials. Dehydrated foods have decided advantages in that shipping weight of dried products is only a fraction of that of the original food. This is of particular advantage now, when shipping tonnage and space must be conserved.

ARMY TAKES OVER WILLIAM WIRT WINCHESTER HOSPITAL

The 160 bed William Wirt Winchester Hospital, New Haven, Conn., which was established in 1918 as a tuberculosis hospital, has been leased as an army hospital for the period of the national emergency. The need for an army hospital at this location became imperative with the recent growth of the army air school at Yale University. The William Wirt Winchester Hospital was used by the army during World War I but has been vacant since 1940. Together with the building, which costs about $1,325,000, is 44 acres of land.

GRADUATES OF SPECIAL TRAINING COURSE

Fifty-six officers of the Medical Department of the Army graduated at the Medical Field Service School, Carlisle Barracks, Pa., February 5, from a special training course and left immediately for assignments in the medical battalions of infantry divisions now being activated. Thirty-two officers of the class had previously graduated from a basic course at the school, the only service school training Medical Department officers for field duty. Of the fifty-six officers, forty-six hold commissions in the Medical Corps, eight in the Medical Administrative Corps and one each in the Dental and Veterinary Corps. Four of the officers are majors, twenty-five are captains, twenty-two are first lieutenants and five are second lieutenants. New York had the largest number in the class with thirteen, and Ohio was second with six. The scope of the course was broad, since the officers will range in posts from commanding officers of the battalion to supply officers. Another class arrived February 8 to begin another special training course.

CIVILIAN DEFENSE

DUTIES OF CITIZENS DEFENSE CORPS IN GAS DEFENSE

A program for civilian protection against gas is being rapidly developed by the Medical Division of the Office of Civilian Defense. Courses have been presented for physicians selected from the faculties of medical schools to be trained as instructors in the medical aspects of chemical warfare. Arrangements are now being made for the presentation of courses by these instructors in their own medical schools.

Training for nonmedical personnel is provided in gas specialist courses which since early December have been presented monthly at War Department civilian protection schools. These schools are located at Amherst College, Amherst, Mass.; Purdue University, Lafayette, Ind.; Loyola University, New Orleans; Occidental College, Los Angeles; Stanford University, Palo Alto, Calif., and the University of Washington, Seattle.

The Gas Protection Service of the U. S. Citizens Defense Corps has been organized as follows: The Medical Division of the Office of Civilian Defense has a gas protection section responsible for organization and training for gas defense. This section functions through the nine civilian defense regions, which are coterminous with the service commands of the U. S. Army. Regional gas officers have been designated for several of the coastal regions to supervise and assist the state gas consultants and the senior gas officers of defense councils in the organization of state and local programs. The senior gas officer trains gas reconnaissance agents who serve in each zone of the city. These men are responsible for the identification of the agent, the collection of samples, the prevention of casualties, the delimiting of gassed areas and cooperation with the Emergency Medical Service, the health department and other agencies concerned in protection against gas.

Instructions to members of the U. S. Citizens Defense Corps on their duties in gas defense have been issued by the U. S. Office of Civilian Defense in Operations Letter No. 104 (Supplement 3 to Operations Letter No. 42), dated January 11.

DUTIES OF EMERGENCY MEDICAL SERVICE

For the Emergency Medical Service the duties are set forth as follows:

Duties Before Gas Attack.—1. Plan with assistance of senior gas officer for the establishment of gas cleansing stations for cleansing gassed patients with other injuries and for cleansing of civilian protection personnel. Each hospital of 150 beds or more should be provided with a cleansing station. Cleansing stations should be available in the ratio of one per 50,000 of population and should be located at smaller hospitals or casualty stations where 150 bed hospitals are not available in this ratio.

2. Recruit, train and assign personnel to gas cleansing stations for cleansing services.

3. Provide instruction, in cooperation with the senior gas officer, for general public and civilian protection personnel in self protection and self cleansing (Operations Letter 46).

4. Provide for instruction of physicians in diagnosis and treatment of chemical casualties.

5. Assist hospitals in planning for handling of gas casualties.

6. Assure adequate distribution of protective clothing and gas masks and other protective equipment to members of mobile medical teams and train personnel in their use.

7. Make provision for training drivers of ambulances and sitting case cars in protection of their equipment against liquid gas contamination; inform them of arrangements for vehicle decontamination by Emergency Public Works Service.

8. Arrange for the protection from contamination of the equipment used to transport contaminated casualties as far as it is possible.

Duties During Gas Attack.—1. On advice of the senior gas officer and under the orders of the commander, man the gas cleansing stations.

2. Advise other services of the U. S. Citizens Defense Corps in regard to first aid cleansing of their personnel.

3. Assign a mobile medical team to gas cleansing stations for first aid.

Duties After Gas Attack.—1. Evaluate the effectiveness of the cleansing procedures which have been used.

2. Provide follow-up treatment of patients.

3. Prepare inventory of protective equipment available for use in future attacks and obtain additional equipment as necessary.

4. Cleanse bodies of the dead to facilitate identification.

FUNCTIONS OF HEALTH DEPARTMENT

Important functions assigned to the health department in the local program of gas defense are as follows:

Duties Before Gas Attack.—1. Provide for analyses for war gases in samples of food and water. These tests may be performed in a local health department if laboratory facilities are adequate. In such case it is desirable to utilize the same laboratory facilities for the analysis for war gases of air and other materials. Where laboratory facilities other than those of the local health department are more suitable for use in the analysis of war gases, arrangements should be made by the local health department for the analysis of samples of water and food.

2. Advise the senior gas officer regarding the nature of instructions to the public concerning precautions to be taken in the event of water supply contamination. Such instructions are to be promulgated by the health officer.

3. Cooperate with waterworks officials in planning for the protection and decontamination of the water supply.

Duties During Gas Attack.—1. Collect samples of food and water for laboratory analysis if contamination is suspected.

2. Inform the public regarding contamination of food and water supplies, including recommendations in regard to self protection.

Duties After Gas Attack.—1. Decontaminate, destroy or otherwise provide for the handling and disposal of contaminated food supplies.

2. Assist the waterworks in the treatment of contaminated water supplies.

3. Advise the senior gas officer in regard to the safety of the public water and food supplies and inform the public regarding contamination of such supplies and methods of dealing with it.

4. Obtain reports of analyses of samples of water or food and take appropriate action. Save specimens of contaminated water and food for transmission whenever necessary to a Chemical Warfare Service or other laboratory, by the senior gas officer.

Gas masks are now being distributed to the personnel of the protective services. As a guide to local distribution and care of masks, the Office of Civilian Defense issued Operations Letter No. 106, January 20, which was published in THE JOURNAL, February 6, page 438.

SIMPLIFICATION OF EMERGENCY MEDICAL SERVICES

The Office of Civilian Defense, Washington, D. C., has, according to the Washington *Evening Star*, recommended to local defense councils a simplified plan of operating their emergency medical services. James M. Landis, director of the Office of Civilian Defense, recommended a reduction in the number of casualty stations for the slightly injured and the abolishing of most first aid posts at the scene of accidents and all first aid parties as such. The District of Columbia at that time had seventy-eight casualty stations. Mr. Landis said that the British have found that more lives can be saved if the bombing victims are treated at the scene of the incident only for the arrest of the hemorrhage and the treatment of shock and then only by doctors or nurses or by rescue workers directly under them. Many preconceived notions concerning first aid have been dispelled by the experiences of Great Britain under air raid conditions. Most of the victims of air raids are severely injured or dead, having been crushed under the débris of demolished buildings, and less than one third are slightly injured and can be cared for at the casualty stations, as the severely injured must go to a hospital. Under the new plan recommended, first aid would be limited to a few simple measures administered at the scene by medical personnel or a rescue team under professional direction.

CIVIL AIR PATROL WILL TRANSPORT PLASMA IN EMERGENCIES

James M. Landis, U. S. director of civilian defense, has arranged for the Civil Air Patrol to fly blood plasma supplies into stricken areas in the event of emergencies, the Medical Division, Office of Civilian Defense, announced in circular Medical Series No. 27, February 1.

In instances in which it becomes necessary to supplement local stocks of plasma for the treatment of casualties caused by bombing, fire, tornado or other disaster and other methods of transportation are not available or are inadequate, the regional medical officer of civilian defense is instructed to get in touch with the appropriate wing commander of the civil air patrol and request emergency transportation for the plasma. Wing commanders have been authorized to accept such requests only from the regional medical officers.

These arrangements apply for all states except those located within the jurisdiction of the Western Defense Command, the circular states. It is understood that in those states the Western Defense Command has sufficient nontactical airplanes available to furnish such transportation.

CIVILIAN DEFENSE PERSONALS

Dr. Hamilton Southworth, New York, recently joined the staff of the Medical Division of the Office of Civilian Defense, Washington, D. C., as a member of the scientific development and research section. Dr. Southworth, who has been commissioned in the grade of surgeon in the U. S. Public Health Service, was expected to go to London to represent the Medical Division as an intelligence officer. He is a graduate of Yale University and of Johns Hopkins University Medical School,

Baltimore, and since 1937 has been assistant in medicine at Columbia University College of Physicians and Surgeons, New York, and assistant physician at the Presbyterian Hospital and the New York Neurological Institute.

Eugene W. Scott, Ph.D., research assistant at the Kettering Laboratory of Applied Physiology, University of Cincinnati, has been appointed gas officer in the Medical Division of the Office of Civilian Defense. Dr. Scott, a graduate of the University of Illinois at Urbana, received his doctorate in 1931 at Cornell University, majoring in organic chemistry, optical chemistry and biochemistry.

Amos J. Alter, sanitary engineer of the Indiana State Board of Health, Indianapolis, has been commissioned assistant sanitary engineer in the U. S. Public Health Service Reserve and assigned to the Medical Division of the Office of Civilian Defense in Washington. Mr. Alter graduated from Purdue University School of Civil Engineering, Lafayette, Ind., and later did postgraduate work in public health engineering at the University of Michigan, Ann Arbor.

Ralph E. Tarbett, who has been chief sanitary engineer of the Office of Civilian Defense in Washington since August 1941, has been recalled to the U. S. Public Health Service by the Surgeon General, where he will assume the direction of the federal facility security program as it relates to domestic water supplies, and sanitary engineer Gordon E. McCallum has been designated as the acting chief engineer in his stead. Mr. McCallum has been an officer of the Public Health Service since 1939.

MISCELLANEOUS

PROCUREMENT OF SANITARY ENGINEERS

Paul V. McNutt, chairman of the War Manpower Commission, has taken steps to provide for the effective distribution of sanitary engineers among the Army, Navy, Public Health Services and state and municipal agencies. To locate and assign such personnel to the war services, Mr. McNutt established a committee within the Procurement and Assignment Service for physicians, dentists and veterinarians. The chairman of the committee is Abel Wolman, professor of sanitary engineering at Johns Hopkins University and chairman of the National Research Council's committee on sanitary engineering. This committee was established at the request of the Surgeon Generals of the Army, Navy and Public Health Service.

Professor Wolman will sit as a member of the directing board of the Procurement and Assignment Service; the other members of the committee are:

Kenneth F. Maxcy, secretary, professor of epidemiology, School of Hygiene and Public Health, Johns Hopkins University, Baltimore.

Harold E. Babbitt, professor of sanitary engineering, University of Illinois, Urbana.

F. C. Bishopp, assistant chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

V. M. Ehlers, chief engineer, Texas State Board of Health, Austin.

Gordon M. Fair, professor of sanitary engineering, Harvard University, Cambridge, Mass.

H. A. Whittaker, chief engineer, Division of Sanitation, Minnesota State Department of Health, Minneapolis.

J. K. Hoskins, senior sanitary engineer, U. S. Public Health Service, Washington, D. C.

Because the National Research Council committee already had considered the difficulties found in the procurement and assignment of sanitary engineers for military and civilian groups in the United States and foreign countries and had begun a canvass to determine the availability of the engineers and the prospective demands for them, Mr. McNutt asked its members to serve on the new committee (THE JOURNAL, January 9, p. 138).

NURSES WANTED FOR CIVILIAN AND MILITARY NEEDS

Sixty-five thousand young women must enter schools of nursing between June 30, 1943 and July 1, 1944 if even minimum civilian and military needs of the nation are to be met, Paul V. McNutt, Federal Security Administrator, announced on January 14. This quota, which exceeds the previous year's quota by 10,000, was reached at a meeting in Washington of the subcommittees on nursing and hospitals of the health and medical committee, Office of Defense Health and Welfare Services. Where state laws permit, schools of nursing are urged to accelerate their courses to reduce the usual training period from three years to thirty months, and in some instances even a little shorter time. In most cases a college degree subtracts nine months from the course. Federal and private scholarships for nursing education are available. Details regarding entrance requirements may be secured from the National Committee on Recruitment of Student Nurses, 1790 Broadway, New York. In general the following are basic qualifications required of an entrant: She must be between 18 and 35 years old, physically fit and have at least a high school education. She may be either married or single.

PUBLIC HEALTH UNDER HITLER

DNB of Dec. 10, 1942 reports from Lwów the establishment of an institution to protect Europe from the dangers to health which threaten from the east. This is a great typhus (fleckfieber) research institute which bears the name of Emil von Behring.

Besides the governor general, Reich Minister Dr. Frank and numerous representatives of state, armed forces and party, a large number of scientists from all parts of the reich and representatives of the Italian and Hungarian armed forces were present at the solemn ceremony. The governor general announced that the fuehrer had awarded on the occasion of the ceremony the War Merit Cross (first class) to two important pioneers of medical science and research in the general government, Dr. Robert Kudicke and university assistant Dr. Wohlrab, who had earned special merit for their work in combating typhus. Prof. Dr. Blome, as representative of Reich Health Leader Dr. Conti, conveyed the latter's greetings and then gave a survey of the origin and combating of epidemics in wartime. After thanking the administration and the doctors for the successful work done in the field of health, Prof. Dr. Blome declared that the Lwów Institute was to be developed into the greatest typhus institute in the whole world. At the end of the ceremony those present went round the new research institute, which has already started work.

Reports from Riga in DNB of Dec. 8, 1942 state that efforts are being made to combat typhus, which had its greatest hold in Lithuania and White Russia. Last year's outbreak could be kept within bounds, and precautions are being taken to check any fresh outbreak in its initial stage. This is being done largely by delousing the population. A special medical school has also been founded in Riga and there can be no fear of an epidemic now.

According to Bersen of Dec. 1, 1942 the scarlet fever epidemic has now reached general hospitals. "Ear patients" from St. Joseph's Hospital, who were infected with scarlet fever, have been transferred to the isolation hospital. Eight children from Bolbro Children's Home have been removed to Middlefart Hospital because the Odense isolation hospital is full.

According to Havas of Dec. 10, 1942 an agreement has been reached between the French and the German authorities regarding the repatriation of sick or wounded French prisoners who have been found unfit for military service for at least a year. The repatriation is to be carried out in accordance with the provisions laid down by the Geneva Convention. The French prisoners' physical state of unfitness has to be decided by a medical commission. It is brought to the knowledge of any whom it may concern that the German authorities do not accept individual applications.

According to *Medizinische Welt,* Berlin, Oct. 31, 1942, in a lecture in Breslau Professor Kathe spoke about food poisoning. In spite of strict regulations to prevent poisoning from contaminated food there had been a severe epidemic of meat poisoning, and five deaths had occurred through infections with the bacillus Newport.

It is stated in the *Zeitschrift für Parasitenkunde,* Berlin, 1941, in an article on trichinosis by Lehmensick and Sendisaya, that two great epidemics of trichinosis had occurred in the German army, one in Poland and the other in Norway.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 1749 has been reported to the House, proposing to grant medical and hospital treatment, domiciliary care and burial benefits, now available to veterans of World War I, to any officer, enlisted man or woman, member of the Army Nurse Corps (female) or Navy Nurse Corps (female) employed in the active military or naval service of the United States on or after Dec. 7, 1941 and before the termination of the present war.

Bills Introduced.—The President has submitted to the Congress a supplemental estimate of appropriation for the Children's Bureau for the fiscal year 1943 in the amount of $1,200,000 for grants to states to provide, in addition to similar services otherwise available, medical, nursing and hospital maternity and infant care for wives and infants of enlisted men in the armed forces of the United States of the fourth, fifth, sixth or seventh grades. From the funds recommended, it is contemplated, payments will be made to physicians for obstetric care, hospital and nursing services, and payment for medical care of infants. S. 654, introduced by Senator Reynolds, North Carolina, proposes to establish a Chiropody Corps in the United States Army. Appointees will be required, the bill provides, to pass a similar physical examination as provided for the appointment of officers of the Medical Corps and a professional examination to include tests of skill in practical chiropody and proficiency in the usual subjects taught in schools of chiropody. S. 668, introduced by Senator Bilbo, Mississippi, and H. R. 1706, introduced, by request, by Representative Lesinski, Michigan, propose to authorize the Veterans' Administration to provide vocational rehabilitation and assistance in securing suitable employment for service connected disabled veterans. S. 662, introduced by Senator Bilbo, Mississippi, would authorize pensions for certain physically or mentally helpless children. S. 655, introduced by Senator Thomas, Oklahoma, proposes to establish a United States Medical Academy for the training and instruction of persons in a manner which will best fit them for the performance of service as commissioned officers in the medical branches of the military and naval forces of the United States. H. R. 1673, introduced by Representative Walter, Pennsylvania, proposes a federal appropriation of $1,500,000 to construct a veterans' hospital in the eastern part of the state of Pennsylvania for the treatment of general medical and surgical disabilities, the hospital to have a capacity of at least 400 beds. H. R. 1696, introduced by Representative Reed, New York, proposes to exempt certain religious, charitable, scientific, literary and educational organizations from the requirement of withholding the victory tax. H. R. 1764, introduced by Representative Green, Florida, proposes to authorize an appropriation of $10,000,000 to acquire a site and to build thereon a naval hospital in Florida to accommodate 1,000 bed patients. H. R. 1754, introduced by Representative Miller, Connecticut, proposes to authorize an appropriation of $350,000 to enlarge the veterans' administration facility at Newington, Conn., to increase its capacity to provide accommodation for a total of approximately 500 bed patients.

STATE MEDICAL LEGISLATION

Arkansas

Bill Introduced.—S. 64, to amend the basic science act, proposes that the basic science board must waive examination on recommendation of any of the various boards authorized to issue licenses to practice the healing art or any branch thereof, provided such recommendation specifies that the applicant has passed an examination in the basic sciences before a board authorized to issue licenses to practice the healing art in some other state.

California

Bills Introduced.—S. 879, to amend the unemployment insurance act, proposes regulations for the establishment of a system of social insurance. S. 885, to amend the unemployment insurance act, proposes regulations for the establishment of a system of disability unemployment insurance. A. 1079, to amend the unemployment insurance act, proposes the establishment of a system of compulsory health insurance. A. 1110, to amend the business and professions code, proposes the creation of a board of examiners for chiropody, defined as the diagnosis, medical, surgical, mechanical, manipulative and electrical treatment of the human foot, including the nonsurgical treatment of the leg. No chiropodist shall do any amputation or use any anesthetic other than local. A. 1171, to amend the business and professions code, proposes the appointment by the board of medical examiners of committees to determine the following: (1) whether an applicant fulfils all the requirements for the certificate for which he is applying, (2) whether an applicant shall be admitted to an examination and the terms and conditions of his admittance, (3) whether a recommendation should be made to the members of the board that the certificate applied for be issued. A. 1174, to amend the business and professions code, proposes conditions under which a person whose certificate has been revoked or suspended for more than one year may be reinstated. A. 1175, to amend the business and professions code, proposes that applicants for a license to practice medicine must have received a diploma from an approved school. A. 1191, to amend the welfare and institutions code, proposes that no person shall maintain an establishment for the mentally ill without having obtained a license from the state department of institutions. A. 1499, to amend the labor code, proposes that when an employee is dissatisfied with the medical treatment he is receiving from a physician furnished by the employer he may, at the expense of the employer, receive the services of a consulting physician and such other physicians as the consulting physician may designate.

Connecticut

Bills Introduced.—S. 461, to amend the workmen's compensation act, proposes to repeal the section authorizing employers to accept waivers from employees with physical defects. Substitute for S. 486, to amend the osteopathic law, proposes to extend the scope of osteopathy to entitle an osteopath to use antiseptics, sedatives and narcotics, endocrines, vitamins and vaccination and to perform such diganostic procedures as are taught in schools of osteopathy approved by the state board of osteopathic registration and examination; provided that no osteopathic physician shall be authorized to compound a prescription for drugs other than the above for internal medication. Substitute for H. 313, proposes that no articles having special utility for the prevention of conception shall be sold at retail except in a store under the supervision of a licensed pharmacist, but any person registered for the practice of medicine in Connecticut may prescribe contraceptive devices for a married woman where her life or health would be endangered by further pregnancy. Substitute for H. 591 proposes regulations for the establishment of a Connecticuat Cash Sickness Compensation Act. H. 717 proposes that no doctor shall charge over $2 for an office call or over $5 for a house call.

Delaware

Bill Introduced.—H. 97, to amend the workmen's compensation act, proposes to authorize an employee to engage a physician or surgeon other than the one furnished by the employer and to receive from the employer the reasonable cost of such services.

Georgia

Bill Introduced.—H. 138 proposes to authorize the state board of health to license maternity homes and adopt rules and regulations governing and protecting the standards of service therein and to make rules and regulations concerning the certification of midwives.

Idaho

Bill Passed.—H. 43 passed the senate on February 5. It proposes that each applicant for a marriage license produce a certificate signed by a licensed physician certifying that the applicant has been thoroughly examined and is not infected with syphilis in a communicable stage. The physician making the examination may not charge more than $2.

Indiana

Bills Introduced.—S. 135 proposes to prohibit school authorities from employing food handlers who are addicted to drugs or who have tuberculosis or syphilis in an infectious stage and to require all school employees to undergo a physical examination for tuberculosis at least once every three years by a duly licensed doctor of medicine. S. 177 proposes the creation of a state board of natural therapeutic physicians, the practice of natural therapy being defined as diagnosis and treatment of human ailments, as taught in chiropractic, naturopathic and physiotherapy schools. H. 317, to amend the vital statistics act, proposes that the state board of medical registration and examination may revoke the license of a physician who has failed to comply with its terms. H. 326 proposes to require persons maintaining a nursing or boarding home for aged persons to obtain a license therefor. H. 357 proposes the furnishing of necessary medical care to the parents of dependent children. H. 393, to amend the medical practice act, proposes to eliminate the provision authorizing the attorney general to make use of the injunctive process in enforcing the act. H. 413 proposes that every person employed in a place serving food shall secure a certificate from the health officer showing freedom from contagious, infectious and communicable diseases and limits the health officer to a fee of $2 for such certificate and examination. H. 440 proposes the following definitions: (1) chiropractic—the science of locating and adjusting the subluxations of the articulations of the human spine and its adjacent tissues, (2) physical therapy—the practice of healing, or the administering to and treating of the sick and suffering by means of natural and physical agents, (3) naturopathy—the process or system whereby remedies for disease are discovered and whereby said remedies are applied to the healing of disease without drugs, which employs various methods to assist nature in repelling the disease, (4) mechano-therapy—the treatment of disease by mechanical means, (5) electrotherapy—the use of electricity for therapeutic purposes and (6) hydrotherapy—the use of water for therapeutic purposes.

Bills Passed.—S. 4 passed the senate on February 6. It proposes the enactment of a law to license and regulate nursing homes. H. 66 passed the house on February 8. It proposes the enactment of a law regulating the operation of plants for the cold storage of food in individual lockers. Among other things the bill proposes that all employees of such locker plants shall undergo a semiannual health examination by a physician and requires the employer to keep such health certificates on file at all times.

Kansas

Bills Introduced.—S. 112 proposes to authorize the establishment of experimental classes to test the merits of the science of psychophonophysics. S. 122 proposes to authorize the release of a person from an insane asylum on the basis of a certificate that he has undergone an operation which has eliminated his carnal tendencies.

Maine

Bills Introduced.—S. 175 proposes that the fees of expert witnesses in homicide cases shall be paid by the state. H. 259, to amend the act relating to infectious and communicable diseases, proposes to require every physician to report all cases of syphilis, gonorrhea, chancroid and lymphogranuloma venereum which come to his knowledge. H. 328 proposes, among other things, to authorize the state board of registration of medicine to issue temporary emergency certificates to qualified physicians now licensed to practice in other states. H. 632, to amend the premarital examination law, proposes that applications for marriage by a member of the armed forces will be accepted if accompanied by a report of a physical examination by any doctor of the armed forces.

Maryland

Bill Introduced.—H. 209, to amend the medical practice act, proposes to authorize the board to grant temporary permits to practice medicine to qualified persons.

Bill Passed.—S. 84 passed the senate on February 3. It proposes to amend the medical practice act by eliminating the proviso that no two courses of medical lectures shall be either begun or completed within the same calendar year. This amendment is apparently for the purpose of enabling graduates of accelerated medical courses to obtain licensure in Maryland.

Massachusetts

Bill Introduced.—H. 864 proposes to authorize the department of public welfare to grant licenses for the maintenance of convalescent or nursing homes.

Michigan

Bills Introduced.—S. 3, to amend the divorce laws, proposes to authorize the granting of divorces on the ground of insanity. H. 99, to amend the chiropractic act, proposes to extend the scope of chiropractic to include the diagnosis and treatment of diseases and injuries by the use of air, light, heat, cold, water, electricity, diet, physiotherapy and all necessary hygienic and sanitary measures incident to the care of the body, and to authorize chiropractors to sign death and health certificates and report to the health officer the same as all other persons authorized to do so under the public health laws. No chiropractor, however, shall be entitled to practice medicine or surgery. H. 100 proposes that the services and facilities of all state laboratories shall be available to all licensed members of the healing professions without discrimination.

Minnesota

Bill Introduced.—H. 273 proposes that physicians in the armed forces shall not be required to renew their annual licenses during the term of such service and shall be exempt from payment of all renewal fees.

Bill Enacted.—H. 160 has become chapter 16 of the Laws of 1943. It requires maternity hospitals to file a written report with the director of social welfare of the birth of any child known or believed to be illegitimate within twenty-four hours after the birth occurs.

Missouri

Bill Introduced.—H. 134 proposes that it shall be the duty of every attending or consulting physician having charge of any minor under the age of 6 who is totally deaf or whose hearing is impaired to report that fact to the state superintendent of public schools and furnish such information as the superintendent may request.

Bill Passed.—H. 45 passed the house on February 9. It proposes to amend the marriage law by requiring any person applying for a license to marry to furnish a report of a negative laboratory serologic test for syphilis and an affidavit signed by him or herself that he or she is free from syphilis. If the laboratory test is positive, the applicant must present a certificate from a physician licensed to practice in the state of Missouri certifying that the applicant is not infected with syphilis in a communicable stage.

Montana

Bill Introduced.—S. 63 proposes to authorize certain institutions of higher learning in Montana to obtain custody of unclaimed human bodies for use in the teaching and demonstration of anatomic science by professional instructors.

Nebraska

Bills Introduced.—L. B. 243, to amend the chiropractic law, proposes to define chiropractic as the science of locating and removing interference with the transmission of nerve energy without the use of medicine or surgery. L. B. 274, to amend

the medical practice act, proposes to eliminate the requirement that no one of the necessary four courses of lectures of eight months each may be given within one year and to provide only that they may not be given concurrently. The purpose of this proposal is apparently to enable graduates of accelerated medical courses to obtain licensure in Nebraska. L. B. 279, to amend the medical practice act, proposes that no licensee shall be required to pay annual renewal fees while in the military service of the United States.

New Hampshire

Bill Introduced.—H. 267, to amend the medical practice act, proposes to authorize the board of registration in medicine to issue licenses to practice physiotherapy, defined as the treatment of any person by physical means including the use, alone or in combination, of massage, heat, light, water or electricity, or by any laying on of the hands for the purpose of effecting relief or cure of any injury or physical ailment.

Bill Passed.—H. 54 passed the house on January 28. The bill proposes the establishment of a state department of health to take over the powers and duties of the state board of health.

New Jersey

Bill Passed.—A. 93 passed the assembly on February 1. The bill proposes to amend the medical practice act by granting an extension of two years within which a licentiate must furnish proof of his actually having become a citizen.

New Mexico

Bills Introduced.—H. 65 proposes that all applicants for a marriage license shall file a certificate from a physician and surgeon duly licensed to practice medicine and surgery in the state of New Mexico certifying that the applicants are free from syphilis in a communicable stage. H. 71 proposes the creation of a state board of therapeutic physicians and defines natural therapy as the diagnosis and treatment of human ailments, the manual and mechanical manipulation of the human body, the correction of feet, the use of bio-chemistry, herbal remedies, cell salts, diet and all material health sciences, and the application of heat, cold, air, water, light, electricity radiant energy and exercise in the treatment of disease, injury or deformity, and for relaxing muscles, restoring normal circulation and function and regulating body chemistry, physiotherapy, electro-therapy, physicaltherapy, hydrotherapy, "coloioherapy" [sic] and first aid in emergencies.

New York

Bills Introduced.—S. 278 proposes to authorize the state commissioner of health to employ necessary medical and health personnel for rendering services in areas designated by the governor as being emergency health and sanitation areas by virtue of an inadequacy of medical facilities or personnel therein. Compensation to such employed medical personnel may be paid by the state department of health. A. 604 proposes that all railroads and other public carriers shall carry a first aid kit for the convenience of the passengers should an emergency arise. A. 630, to amend the workmen's compensation act, proposes to require an employer to furnish medical care to an employee mentally disabled as the result of an occupational injury.

North Carolina

Bill Introduced.—S. 95 proposes the creation of a board of naturopathic examiners. No definition of naturopathic practice is stated, it being provided only that a naturopath shall not practice any other treatment authorized or provided for by law for the cure and prevention of disease or ailments.

North Dakota

Bill Introduced.—H. 131 proposes the creation of a board of naturopathic examiners and defines naturopathy as the art and science of applied therapy as heretofore or hereafter taught in the recognized schools and colleges of naturopathy, except materia medica and major surgery.

Bill Passed.—S. 63 passed the senate on February 9. It proposes to prohibit the sale of barbital except on a written prescription by a doctor of medicine, doctor of dental surgery or doctor of veterinary medicine lawfully practicing his profession in the state.

Ohio

Bills Introduced.—H. 95, to amend the medical practice act, proposes certain changes in the causes and procedure for revocation of a license. H. 244, to amend the enabling act relating to the establishment of medical service plans, proposes that physicians in the armed forces shall be considered as residing and actively practicing in the county in which they previously resided and proposes further that no certificate, authority or license to operate a medical service plan under the enabling act shall be issued for the duration of the war or within six months thereafter.

Oklahoma

Bills Introduced.—S. 90, to amend the income tax law, proposes to authorize taxpayers to deduct expenses for physicians' fees, hospital bills, nurses' fees, ambulance charges and all other medical expenses. H. 222, to amend the medical practice act, proposes that the members of the board of examiners must be citizens.

Oregon

Bills Introduced.—S. 119, to amend the workmen's compensation act, proposes to redefine "occupational injury" so as to include occupational diseases peculiar to the trade or occupation in which an employee was engaged and due to causes in excess of the ordinary hazards of employment. H. 193, to amend the law relating to the examination of handicapped children, proposes to authorize eye examinations of such children to be made by qualified and licensed oculists or optometrists. H. 245 proposes to require persons maintaining a hospital for the treatment of persons with mental disorders or mental defects to obtain a license from the state board of health. H. 303, to amend the workmen's compensation act, proposes to authorize an injured employee to receive treatment by a Christian science practitioner in lieu of medical treatment, unless the employer has elected not to be subject to such provision.

Bills Passed.—S. 91 passed the senate on February 4. It proposes to amend the osteopathic practice act by requiring osteopaths to register annually. H. 222 passed the house on February 4. It proposes to amend the chiropractic law to require chiropractors, at the time of the annual renewal of their licenses, to present proof that they have attended a two day educational program conducted by the Oregon chiropractic association.

Bill Enacted.—H. 32 was approved by the governor on February 2. It repeals the law relating to the office of state bacteriologist who was authorized to make scientific studies and investigations of animal and plant diseases.

Pennsylvania

Bill Introduced.—H. 161 proposes conditions for the compulsory and voluntary sterilization of persons afflicted with any presumably hereditary form of mental deficiency on the certification of qualified physicians. Excepted from the proposal would be sterilizations performed for therapeutic reasons such as tuberculosis, heart disease, tumors or infections.

Rhode Island

Bill Introduced.—S. 42 as amended, to amend the basic science law, proposes to exempt from the operation of the act all persons who had on April 27, 1940 already commenced the study of one of the healing arts at an approved school.

South Carolina

Bill Passed.—H. 33, to amend the medical practice act, passed the house on January 27 and the senate on January 28. The proposal would remove the existing requirements that no two of the required four full courses of lectures of at least twenty-six weeks may be given in the same year. The purpose of this proposal is apparently to enable graduates of accelerated medical courses to obtain licensure in South Carolina.

South Dakota

Bill Introduced.—H. 84, to amend the workmen's compensation act, proposes to add necessary first aid treatment to the services to be furnished by the employer.

Bill Passed.—H. 32 passed the senate on February 5. It proposes that osteopaths be required to renew their certificates

to practice annually and to submit evidence, at the time of such renewal, of attendance of at least two days at the annual educational program conducted by the South Dakota state osteopathic association during the preceding year.

Tennessee

Bills Introduced.—S. 460 proposes an enabling act to provide for the organization, operation and regulation of nonprofit corporations desiring to operate a nonprofit hospital service plan. Hospital service and hospital care are defined as including bed, board, use of operating room, ordinary medications, surgical dressings and other routine procedures approved by the state board of health, and general nursing care. S. 490, to amend the unemployment compensation act, proposes that the term employment shall not include services performed as an intern. S. 506, to amend the pharmacy law, proposes conditions under which a person has been engaged in conducting a drug store for twenty-three successive years may be authorized to compound and fill physicians' prescriptions and be licensed as a pharmacist without examination. H. 640 proposes the repeal of the existing premarital examination law. H. 700, to amend the workmen's compensation law, proposes a list of some fifteen occupational diseases which shall be included within the meaning of injury or personal injury arising out of the course of a person's employment. H. 702, to amend the workmen's compensation law, proposes to enlarge the definition of injury and personal injury so as to include such occupational diseases or infections as arise naturally out of such employment or as naturally and unavoidably result from such accidental injury. The present law only covers occupational diseases naturally arising from the injury. H. 903, to amend the workmen's compensation act, proposes that the employer shall designate a group of three or more reputable physicians or surgeons from which the injured employee shall have the privilege of selecting the operating surgeon or the attending physician.

Bills Passed.—H. 39 passed the house on February 5. It proposes that hospitals and physicians called on to render aid to persons suffering from any wound or other injury inflicted by means of a knife, pistol, gun or other deadly weapon or suffering from the effects of poison or suffocation shall report the same immediately to the chief of police. H. 129 passed the senate on January 28, a bill proposing the creation of a state board of naturopathic examiners. Naturopathy is defined as the prevention, diagnosis and treatment of human injuries, ailments and diseases by means of any one or more of the psychologic, physical or mechanical, chemical or material forces or agencies of nature. H. 323 passed the house on February 2. It proposes to authorize a coroner, when requested so to do by the district attorney general, to summon as a witness a surgeon or physician to make an examination of the body of a deceased, including the performing of an autopsy and to give a professional opinion thereon, the fee for which is not to exceed $25. H. 420 passed the house on February 2. It proposes to prohibit the sale or advertisement of articles used for the prevention of conception without a license issued by the state board of pharmacy, except that physicians and medical practitioners regularly licensed to practice medicine or osteopathy in the state of Tennessee would not be prevented from prescribing such articles.

Texas

Bill Introduced.—H. 274 proposes the creation of a state board of examiners in the basic sciences to examine persons desiring to take an examination for a license to practice the healing art in the subjects of anatomy, physiology, chemistry, bacteriology, pathology and hygiene and public health.

Utah

Bill Introduced.—S. 100 proposes to make it unlawful for any person to maintain a maternity hospital without having first obtained a license from the state board of health.

Bill Passed.—H. 29 passed the house on January 29. To amend the medical practice act, it proposes to authorize the issuance of two different types of naturopathic licenses, (1) to practice as a naturopathic physician without the use of drugs and without surgery and (2) to practice as a naturopathic physician and surgeon including obstetrics.

Vermont

Bills Introduced.—S. 12, to amend the chiropractic law, proposes to require chiropractors to attend a four year, rather than a three year, course of study. H. 50, to amend the medical practice act, proposes to repeal the section setting forth the requirements for admission to practice and to substitute therefor an authorization that the board shall make rules and regulations covering requirements for admission to practice medicine and surgery.

Bill Passed.—H. 49 passed the house on February 3. It proposes to authorize the state board of medical registration to issue temporary emergency certificates to physicians licensed outside the state if found qualified to practice in the state during the emergency.

Washington

Bill Introduced.—H. 136 proposes that hospitals exempt from taxation because of their charitable status shall permit all physicians and surgeons in good standing with the American Medical Association to use their hospital facilities without discrimination.

Bill Passed.—S. 76 passed the senate on February 4. It proposes to exempt members of the armed forces from being required to continue in full force and effect their license to practice a profession in the state. Such may be renewed within six months after an honorable discharge.

West Virginia

Bills Introduced.—S. 36 proposes the creation of a division of cancer control in the state department of health to administer provisions relating to the diagnosis, treatment and care of persons suffering from cancer, including the conduct of an educational program, the establishment of cancer clinics in general hospitals throughout the state and the furnishing of tissue diagnostic service to all patients. S. 71 and H. 120 propose the enactment of enabling legislation for the creation of nonprofit hospital service corporations. H. 16 to amend the sales tax law, proposes to exempt therefrom the sales of medicines by drug stores on prescriptions signed by a physician.

Wisconsin

Bills Introduced.—S. 36 proposes to amend the law relating to coroners so as to provide for the appointment of a medical examiner. S. 53 proposes to exempt members of the armed forces from being required to maintain a license to practice any profession within the state, proposes that this license shall be suspended during the active service of such persons, and proposes that it may be renewed within six months after his discharge. S. 92 proposes to authorize the rendering of necessary nonsurgical hospital or clinic service to persons committed to an insane asylum. A. 65, to amend the basic science law, proposes to authorize the issuance of basic science certificates by the state board of examiners in chiropractic.

Wyoming

Bills Introduced.—S. 9 proposes to authorize any county to create a county health department and to appoint a full time doctor of medicine licensed to practice medicine in Wyoming to serve as county health officer. H. 58 proposes to prohibit the operation of a hospital unless it has secured a license issued by the state board of health. H. 77 proposes regulations for the compulsory sterilization of inmates of certain state institutions if the inmates have been found to be insane, idiotic, imbecilic, feebleminded or epileptic and the probable potential parents of socially inadequate offspring.

Bill Passed.—S. 2 passed the house on February 1. It proposes to amend the premarital examination law, proposes (1) to require the test to be made of females as well as males, (2) to authorize the required certificate to be executed by a physician duly licensed under the laws of the state of Wyoming and engaged in practice therein.

MEDICAL ECONOMIC ABSTRACTS

STATE MATERNITY AND CHILD CARE

The last decade has seen a great increase in the activity of state agencies in supplying medical care to mothers and children. It is not simply that general health services such as public health nursing, education, sanitation and the control of tuberculosis and the venereal diseases has been greatly expanded. During the same period maternal and child health programs have taken on new features and extended old ones.

Maternal and child health care in the various states is distributed among numerous agencies, the most important of which are health departments, welfare, education, labor, state universities and licensing boards. Functions in twelve states are assigned also to other miscellaneous departments.

Education is the principal avenue of approach in the maternal and child health program. This education is directed to the general public and to the mothers and also includes special educational programs for local physicians and dentists. Aid is given in various ways to clinics, and other institutions supply medical care. In all, nearly four fifths of the state health departments either supply personnel or financially aid local maternity (antepartum and postpartum) clinics, while all but three of them contribute in one way or another to similar facilities for infants and preschool children.

Eligibility for clinic service depends, to a large extent, on a patient's economic status. While a few states indicate that the service offered is open to all, most of them stipulate that only the medically needy—variously defined as "all who cannot provide service by their own resources," "referrals from physicians and social workers," "people of county hospital level," "all midwife cases" and "those with a maximum income of $20 per week per couple, plus $3.50 per week for each child"—are accepted. On the whole, economic restrictions for admission to maternity services are more stringent than for admission to services for children.[1]

All state health departments make some health provision for home nursing services for antepartum and postpartum cases, for infants and for preschool children. Only seventeen health departments reported that their medical care programs included attendance at home births. There are thirty-two jurisdictions providing consultant obstetricians to private physicians.

There are few states that now encourage annual examination of all school children. Instead they favor restriction of the number examined with more concentration on correction of defects.

Total expenditures by state governments supplemented by federal aid has increased from $1,382,400 in 1930 to $6,172,600 in 1940.

1. Mountin, Joseph W., and Flook, Evelyn: Maternity-Child Health Activities by State Agencies, United States Public Health Service.

MORTALITY RATES, 1930 TO 1940

While Texas was not admitted to the registration area until 1933, the proportion of the total population included in the death registration area in 1930 was sufficiently large to justify considering the death rates of that area as representative of the entire country. Between 1930 and 1940 the expectation of life at birth of the total population increased from 59.0 to 63.3 years, an increase of 4.3, or 7 per cent. While it has generally been known that the expectation of life at birth has been greatly increased, it has been thought that there was little or no increase during later years. During the last decade, however, there has been a definite increase in life expectation at all ages starting from about 7 per cent at birth and being from 5 to 6 per cent from 5 to 70 years. There has even been an increase of 2 per cent in the expectation at the age of 80. Some doubt is thrown on these figures because of the inaccuracy of recorded ages in the higher brackets.

A possible side light on the effect of these changes in death rates is given by the fact that if the 1,060,000 white males born in 1940 were exposed to current mortality rates about 614,000 would reach the age of 65, but if the mortality rates of forty years ago prevailed only about 413,000 would reach that age.

While Negro death rates still are higher than those of white persons, the decrease is greater for Negroes than for white persons. The expectation of life at birth increased 3.5 years for white males but 4.4 years for Negro males; the increase for females was 4.3 and 5.7 years respectively.

Large decreases were recorded in the death rates from the principal respiratory causes of death: influenza, pneumonia and tuberculosis. The decline in the death rate from tuberculosis is a continuation of the trend observed during recent decades. The lower rate from pneumonia undoubtedly was the result, in part at least, of an increasingly widespread use of serum and drugs in the treatment of this disease. It should be noted, however, that the death rate from influenza also decreased very sharply during the past decade. Part of this decrease may be attributed to the fact that, although the number of cases of influenza was higher than the average during 1939, the disease was not especially fatal, so that the death rate remained relatively low.

While the maternal death rate had shown no decline in the birth registration area previous to 1930 (which was at least partially due to changes in the area itself), during the past decade this rate declined 48 per cent among white mothers and 34 per cent among nonwhite mothers. In 1940 the two rates were 3.2 and 7.7 per thousand live births, respectively.[1]

1. Dorn, Harold F.: Changes in Mortality Rates, 1930 to 1940, Pub. Health Rep. **57**: 1858 (Dec. 4), 1942.

WOMAN'S AUXILIARY

Arizona

The Auxiliary to the Maricopa County Medical Society held a luncheon, recently, at the Arizona Club. The guest speaker was Cavett Robert and his subject "Victory Has a Price Tag." Mrs. Harlan P. Mills, president of the Auxiliary to the Arizona State Medical Society, welcomed the U. S. Army medical officers' wives and stressed the importance of Red Cross work throughout the state.

California

Orange County held a public relations meeting at the home of Mrs. Harry G. Huffman. Mr. Ben H. Read, executive secretary of the Public Health League of California, and Mrs. Walter Egan Toole addressed the meeting.

Members of the Auxiliary to the San Mateo County Medical Society, under the leadership of Mrs. J. Garwood Bridgman, have made sheets for the civilian defense emergency station and handled the canteen work for the San Mateo blood bank. Several auxiliary members were directly responsible for organizing the San Mateo County blood bank.

The Solano County medical auxiliary, with a membership of only thirteen, has done outstanding work in establishing and operating the Vallejo civilian blood bank. Under the leadership of Mrs. Brownlee Perkins, this auxiliary with the assistance of the Medical Society Nurses' Association and prominent members from the community, has financed and operated this blood bank for six months. During April 1942 one thousand persons willing to give blood were signed up by members of the auxiliary.

Pennsylvania

The Huntingdon auxiliary met at the home of Dr. and Mrs. William A. Doebele. Following luncheon, Mrs. F. H. Crumpacker, a missionary from China, gave a talk on her work in that country. Mrs. Crumpacker stressed mostly the poverty and disease prevalent in China. She said that "The atrocities committed by the Japanese are beyond description."

The Jefferson auxiliary met at the Elks' Club in Punxsutawney. Mrs. Lewis R. McCauley, president, presided. The auxiliary voted to sponsor a mobile unit for blood donors to secure blood for the Pittsburgh blood bank. Mrs. John A. Tushim, district councilor, discussed the Medical Benevolence Fund. The auxiliary held a bridge-tea in December and contributed the proceeds to the fund.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Epidemic Cerebrospinal Meningitis.—For the first time since 1929 the reported incidence of cerebrospinal meningitis during 1942 approached epidemic status in San Francisco. During the year 1942 there were 32 cases reported with nine deaths, as compared with the preceding four years, when the average of reported cases per year was 6. The last major epidemic in San Francisco was in 1929, when there were 88 cases reported with eighty-one deaths. The history of cerebrospinal fever has indicated that there are periods of high incidence recurring at fairly long intervals. Increased reporting continues into 1943. During the month of January there were 16 cases reported to the department of public health of the city and county of San Francisco, of which 2 were listed as nonlocal. Among the 16 cases there were two deaths. Twelve of the patients were male and 4 female. The age incidence showed that 4 were in the group under 5 years, 5 in the group 5 to 20 years, 6 over 20 years and 1 in which the age was not stated. Fifteen of the patients were treated in hospitals and 1 patient was treated at home. As to occupation, 5 of the patients were listed as in the armed forces and 4 reported as shipyard workers. A release from the department of public health states that at the time of this reporting in February the increased incidence appears to be continuing.

COLORADO

Annual Registration Due Before March 1.—Every licentiate of the State Board of Medical Examiners of Colorado is required by law to register annually before March 1 with the secretary-treasurer of the board and to pay a fee of $2, if a resident of Colorado, or $10, if a nonresident. Failure to pay this fee within the time stated automatically suspends the right of a licentiate to practice while delinquent. If he nevertheless continues to practice, he is subject to the penalties provided by law for practicing medicine without a license. Failure to pay this fee for three consecutive years results in the automatic cancellation of a delinquent practitioner's license to practice.

DISTRICT OF COLUMBIA

Lecture on Tropical Medicine.—Col. Richard P. Strong, professor emeritus of tropical medicine, Harvard Medical School, Boston, and now director of tropical and military medicine, Army Medical School, gave a lecture in the Smith-Reed-Russell series, February 3, at the George Washington University School of Medicine. His subject was "Tropical Diseases and the War." The Smith-Reed-Russell Society is composed of honor students in the school of medicine and honorary members elected to the society for outstanding achievement.

Personal.—Dr. Edgar A. Bocock, medical superintendent of Gallinger Municipal Hospital, was presented with a number of gifts, Dec. 15, 1942, to commemorate his fifteenth anniversary as head of the hospital.——William E. Leahy, LL.M., director of the Selective Service System for the District of Columbia, was recently awarded the Distinguished Service Medal for 1942 by the Cosmopolitan Club; the award is made annually to the citizen who "has performed the most unselfish service in the community" during the year. Mr. Leahy was a member of the legal counsel that appeared in behalf of the Medical Society of the District of Columbia in the recent trial.——Dr. Winfred Overholser was recently named honorary president of the District of Columbia Occupational Therapy Association.

ILLINOIS

New Central Unit for Typhoid Carriers in Mental Hospitals.—Freud Cottage was recently opened at Manteno State Hospital, Manteno, for the exclusive care and treatment of typhoid carriers in mental hospitals and, according to the *Welfare Bulletin*, is the only unit of its kind in the world. At present there are about 141 carriers accommodated in the new building, which is an old ward unit converted into the new Freud Cottage. One wing in Freud Cottage has subdivisions to provide for isolation of typhoid carriers suffering from additional complicating infections, tuberculosis, pneumonia and other contagious diseases. There is a 10 bed ward for special research in the cure of typhoid carriers and 2 and 4 bed wards to provide for special behavior problems and mental conditions requiring separate care. The entire project stemmed from the typhoid epidemic at the Manteno State Hospital in 1939, when an intensive epidemiologic study with special reference to the source of infection was carried out. The emergency recommendation for a feces and urine survey of all patients in all the mental institutions resulted in the isolation of still other typhoid carriers. Freud Cottage is the fulfilment of a decision by the state departments of health and public welfare to centralize all these patients. Men and women patients are now cared for in Freud Cottage, but it is later expected to open another unit to be known as Prince Cottage, which will be used for men patients only, thus carrying out the original plan of complete segregation.

Chicago

Annual Meeting of Heart Association.—Dr. Arno B. Luckhardt, professor of physiology, University of Chicago School of Medicine, will be the guest speaker at the annual meeting of the Chicago Heart Association at Huyler's Restaurant, February 25. His subject will be "Highlights and Shadows in the Discovery of General Anesthesia."

Personal.—Dr. Russell D. Herrold has been elected secretary-treasurer of the Chicago Urological Society to succeed Dr. Irving J. Shapiro, who has gone into active service with the navy.——Evelyn B. Tilden, Ph.D., formerly of the National Institute of Health, Bethesda, Md., was recently appointed associate professor of bacteriology at Northwestern University Dental School.

Dr. Kreuscher Retires as Chief Surgeon of Steel Corporation.—Dr. Philip Kreuscher, clinical professor of orthopedic surgery at Loyola University Medical School from 1919 to 1932 and assistant professor of surgery, Northwestern University Medical School since 1932, has retired as chief surgeon of the Chicago District, Carnegie-Illinois Steel Corporation, to devote his entire time to his private interests. He had held the position since 1937. Dr. Kreuscher was also medical director for the Industrial Commission of Illinois from 1932 to 1936. He has been succeeded at the steel corporation by Dr. Richard J. Bennett Jr., who since Jan. 1, 1937 has been associate chief surgeon. Dr. Bennett graduated at Temple University School of Medicine, Philadelphia, in 1927.

Lee Memorial Lecture in Chemistry.—Karl Paul Link, Ph.D., professor of biochemistry, University of Wisconsin, Madison, will deliver the Edward C. Lee Memorial Lecture in chemistry in the Kent Chemical Laboratory, University of Chicago, February 25. His address will be entitled "From the Haystack to the Clinic via Coumarin Chemistry" and will be an illustrated description of the application of chemistry to a practical problem in agriculture evidencing a new series of 4-hydroxy coumarins which alter the coagulability of blood. The lecture was established in honor of Edward C. Lee, Ph.D., an alumnus of the University of Chicago who died shortly after receiving his degree. His wife, who established the lecture in 1940, is an alumna of the university.

INDIANA

Silver Star Awarded to Physician.—Capt. William F. Edwards, New Albany, army medical corps, now with the American forces somewhere in New Guinea, has been given a Silver Star for heroic action. According to the state medical journal, Captain Edwards was on duty at an American field hospital, removing a piece of shrapnel from an Australian soldier when Jap bombers attacked. He continued to operate and when the enemy had gone the patient pointed to a machine-gun bullet wound he suffered during the attack and suggested that Captain Edwards perform another operation, which he did, the journal stated.

State Board Modifies Regulations.—The Indiana State Board of Medical Registration and Examination in January modified some of its regulations in an endeavor to help meet the urgent problems created by the induction of a large number of physicians into the armed forces. Heretofore only one examination has been conducted each year, in June, but under the revised schedule an examination will be held approximately every eight months, permitting recent graduates to enter practice or to enlist in military medical units several months sooner than would have been possible under the single examination a year program which had been in effect since the creation of the board. The board held an examination in

January and the next will be in September. A modified regulation has been announced for the licensing of applicants who are graduates of foreign medical schools providing that the repetition of the senior year's work shall be required of graduates of schools located outside the United States and its possessions; excepting, for the duration of the present war, the possessor of a medical diploma representing the full prescribed medical course in a Canadian medical school recognized by the Indiana state examining board. Previous to the modification, graduates of all schools outside the United States and its territorial possessions were required to repeat their senior year's work in an American medical school before they were eligible to take the Indiana license examination. In a further effort to cooperate with the demands of the emergency, the practical examination required of reciprocal applicants from states that require a like examination has been waived for the duration. Under the modification, applicants of other states may be granted reciprocal licensure in about two weeks when practical examinations are not required. With practical examinations, it generally had required about three months for an out of state physician to obtain an Indiana license. The requirement of one year of practice in the state from which the applicant reciprocates was also suspended for the duration.

KENTUCKY

Lectures on Tropical Medicine.—On January 26 Dr. Harold W. Brown, dean of the school of public health, University of North Carolina, Chapel Hill, and professor of public health at Duke University, Durham, gave two lectures on tropical medicine at the University of Louisville School of Medicine on "Malaria" and "Dysentery." On January 27 Dr. M. Ruiz Castaneda of the department of public health of Mexico and professor of the National School of Medicine discussed "Typhus." The lectures were made possible by the National Research Council.

State Owned Maternity Hospital Dedicated.—The Oneida Hospital for Mothers and Babies of the Mountains was recently dedicated, marking the formal opening of the first maternity hospital in the United States owned by a state and operated by a state department of health. The hospital was opened as the Oneida Mountain Hospital in 1928, but in 1936 Dr. C. Adeline McConville, Brooklyn, who established it, offered the building and grounds to the state department of health for use in any way in which it might see fit. In 1941 negotiations were concluded conveying the unit to the commonwealth of Kentucky. Governor Johnson allocated funds to the state department of health for the necessary repairs and improvements, and the U. S. Children's Bureau made available an annual appropriation of $20,000 for its support. The hospital is operated as a unit of the Clay County health department in cooperation with the state department of health and its service program carried out under a plan developed cooperatively by the state department and the U. S. Public Health Service. Patients not able to pay for services are admitted free. Pay patients are charged according to their means with a minimum of 50 cents a day and a maximum of $2.50 a day for hospital accommodations. Physicians in private practice are permitted to bring their patients to the hospital for delivery and are entitled at all times to the consultation services of the resident obstetrician. Dr. Henry H. Caffee, Oneida, is the obstetrician and medical director, and the director of the division of maternal and child health of the state department of health serves as maternal and child health supervisor of the hospital. The hospital has been in operation since December 1941. In the last six months it has had a continuing average of 12 patients, with a peak load of 21. Principal speakers at the recent dedication included Drs. Arthur T. McCormack, Louisville, state health officer, Edwin F. Daily, Children's Bureau, U. S. Department of Labor, Washington, D. C., who was instrumental in establishing the project, Governor Johnson and Dr. McConville. The *Bulletin* of the state department of health for January was dedicated to a historical review of the undertaking.

MINNESOTA

Chiropractor Loses Basic Science Certificate on Abortion Charge.—Henry Wuerzinger, Minneapolis, pleaded guilty at the district court of Hennepin County to practicing medicine without a license. He was sentenced to one year in the county jail but was placed on probation for three years on the condition that he surrender for cancellation his basic science certificate and chiropractic license, turn his medical and surgical equipment over to the Minneapolis General Hospital and return a promissory note in the sum of $75 to the patient who was the principal in the alleged abortion. Wuerzinger was arrested on Oct. 8, 1942 following an investigation of his activities by the Women's Bureau of the Minneapolis Police Department and a representative of the Minnesota State Board of Medical Examiners. It was revealed during the investigation that Wuerzinger had performed a criminal operation on a 22 year old unmarried girl. The patient stated that Wuerzinger charged her $125 in cash and in addition demanded a promissory note of $75 dated July 1 and payable in fifteen days. He had been in similar trouble in 1935.

NEBRASKA

Eleventh Annual Assembly Will Be Held.—The Omaha Mid-West Clinical Society has decided to hold its 1943 assembly at the Hotel Paxton, Omaha, October 25-29.

Personal.—Dr. James K. Newman, Omaha, observed his ninety-fourth birthday on January 5.——Dr. Fred P. Bestgen, formerly of Rapid City, S. D., has been appointed director of the Hall-Adams Health Unit.

Officers of State Medical Board.—Dr. Earle G. Johnson, Grand Island, is president of the state board of examiners in medicine, according to an announcement concerning changes in the board. Dr. Ernest T. Manning, Omaha, is vice president and Dr. George W. Covey, Lincoln, secretary.

Society News.—The Omaha-Douglas County Medical Society was addressed in Omaha recently by Drs. James Dewey Bisgard on "Surgical Treatment of Esophageal Diverticula"; Willis E. Brown, "Complications with Intrauterine Pessaries," and John L. Gedgoud, "Virus Pneumonias."

Serologic Tests of Employees in Industry.—The Omaha-Douglas County Medical Society has approved a plan for large scale serologic testing of employees in industry in and around Omaha. When the plans are completed the society will participate by helping to obtain blood from hundreds of employees in the many plants and indirectly, wherever possible, to encourage those of the group whom they know as patients to submit to the test.

NEW YORK

Graduate Lectures.—Dr. Clayton W. Greene, Buffalo, will speak before the Madison County Medical Society in Oneida, February 23, on "Renal Lesions Simulating Other Maladies." This lecture is the second of two arranged by Dr. Greene under the auspices of the state medical society as postgraduate instruction on the treatment of common diseases. Dr. L. Maxwell Lockie, Buffalo, gave the first lecture, February 11, on "The Management of Arthritis, Acute and Chronic."

New York City

Vesalius Celebration.—The section of historical and cultural medicine of the New York Academy of Medicine sponsored a Vesalius Celebration on January 13 to honor the quadricentenary of the publication of "De Humani Corporis Fabrica (1543)." Papers were delivered by Drs. Arturo Castiglioni, Baltimore, on "Andreas Vesalius, Professor in the Medical School in Padua" and Henry E. Sigerist, Baltimore, "The Position of Vesalius in the History of Medicine." An exhibit of books of Andreas Vesalius from the library of the academy was a feature of the meeting.

Personal.—Dr. John L. Rice, formerly city commissioner of health, has been appointed a consultant to Lederle Laboratories.——Mrs. Max J. H. Rossbach is the new director of child care for the American Women's Voluntary Services in New York.——Dr. Donald D. Van Slyke of the Rockefeller Institute for Medical Research, department of the hospital, has recently been elected an honorary member of the Kungl. Vetenskaps-Societeten (Royal Society of Sciences) of Uppsala, Sweden.——Paul D. Miller, attorney, has been elected president of the Goodwill Industries, a social service organization for the employment and rehabilitation of physically handicapped persons.

New Health Committee for Community Service.—Albert G. Milbank, New York, attorney and president of the Milbank Memorial Fund, on February 3 was appointed chairman of a new health committee of the Community Service Society of New York to study the society's program for the control of preventable diseases in New York. The new committee will "reexamine the health objectives of the Community Service Society in the light of recently acquired medical and scientific knowledge" and "initiate steps to adjust the organization's health and medical activities to rapidly changing conditions." Other members of the new committee include Dr. George Baehr, medical director, U. S. Public Health Service Reserve, chief medical officer, Office of Civilian Defense, Dr. Frank G. Boudreau, Charles C. Burlingham, LL.D., Homer Folks, LL.D., Dr. James Alexander Miller, Bailey B. Burritt and Bayard F. Pope.

Ninth Institute on the Exceptional Child.—"The Outlook for the Exceptional Child in Postwar America" is the theme of the ninth Institute on the Exceptional Child to be held at the school of education auditorium, New York University, February 23. The institute is held annually under the auspices of the Child Research Clinic of the Woods Schools, Langhorne, Pa., but this year is being held also in collaboration with the school of education of New York University. Among the speakers will be:

Herbert B. Bruner, Ph.D., The Responsibility of the States to the Exceptional.
Charlotte E. Grave, Ph.D., Langhorne, The Responsibility of Private Enterprise for the Care of the Exceptional Child in Postwar America.
Dr. Irving Edward Liss, The Outlook in Medicine for the Care of the Exceptional Child in Postwar America.
Dr. Marion E. Kenworthy, What the Psychiatric Field Can Do for the Exceptional Child in Postwar America.
Francis M. Garver, Ph.D., Philadelphia, What is the Outlook in Education for the Exceptional Child in Postwar America?
Mrs. Sidonie Matsner Gruenberg, The Responsibility of the Parent to the Exceptional Child.
Dr. George G. Deaver, What is the Vocational Outlook for the Exceptional Child in Postwar America?
Eduard C. Lindeman, B.S., Creating Public Understanding for Providing Effective Care of Exceptional Children in Postwar America.

NORTH CAROLINA

New Academy of Public Health.—The North Carolina Academy of Public Health was organized at a recent meeting at the state laboratory of hygiene, Raleigh, according to the *Health Bulletin* of the state board of health. The objectives of the new organization, which is said to be the first of its kind in the United States, are the cultivation of the science of public health, the advancement of the character and honor of the public health profession, the elevation of the standard of education of all public health workers and the promotion of public health and the extension of its benefits to all people. Officers of the new group include Dr. George M. Cooper, Raleigh, assistant state health officer and director of the division of health education, crippled children's work, and maternal and child health service, president; Ernest A. Branch, D.D.S., Raleigh, director of the division of oral hygiene, vice president, and Mrs. Annie B. Edwards, secretary to Dr. Carl V. Reynolds, Raleigh, state health officer, secretary and treasurer. The establishment of the new academy of public health was interesting in view of the recent designation of the North Carolina School of Public Health as a center for training of students in public health education from all parts of the United States in a cooperative program between the W. K. Kellogg Foundation and the United States Public Health Service (THE JOURNAL, February 13, p. 525).

OHIO

Medical Officer Cited for Heroic Action.—Lieut. John Robert Schmidt, Cincinnati, M. C., U. S. Naval Reserve, has been cited by the U. S. Navy for heroically carrying out his duties while under fire in the battle of the Midway. According to the state medical journal, Lieutenant Schmidt was also recently mentioned in press dispatches from "somewhere in the South Pacific" for rendering good medical care under adverse conditions aboard a destroyer to survivors of an aircraft carrier sunk by the Japanese.

State Meeting Planned as War Conference.—The annual session of the Ohio State Medical Association will be held at the Neil House, Columbus, March 30-31, on the general theme "Medicine on the Home Front." The afternoon and evening of March 30 will be devoted primarily to business matters and discussions of vital problems arising from the war. A general session will be held the morning of March 31 on "Keeping Them Working," the entire program to be devoted to industrial health. The afternoon session on "Keeping Them Healthy" will cover subjects relating to the health of the civilian population generally under wartime conditions.

Dr. Rollo Baker Named Acting Dean.——Rollo C. Baker, Ph.D., secretary of the Ohio State University College of Medicine, Columbus, since 1934, has been named acting dean of the college and acting director of the University Hospital. Dr. Baker was temporarily appointed to fill the position made vacant on January 15 by the death of Dr. Leslie L. Bigelow, Columbus. Dr. Bigelow had also been serving under a temporary appointment while Dr. Hardy A. Kemp, Columbus, is absent on military service. The new acting dean has been continuously associated with the university since he enrolled as a freshman in 1911, except for a short leave while he was working toward his doctor of philosophy degree at the University of Chicago, which he received in 1927. He was born in Middlebourne in 1888. He received the bachelor of arts degree in 1915 at Ohio State University, became a graduate assistant in that year and continued toward a master's degree, which was awarded him in 1917. From 1918 to 1921 he was an instructor in anatomy, in 1921-1928 an assistant professor and in 1928-1932 an associate professor; since 1932 he has been a full professor.

PENNSYLVANIA

Society News.—Dr. James M. Strang, Pittsburgh, discussed "Use of the Newer Insulins" before the Washington County Medical Society in Washington recently.——The Reading Eye, Ear, Nose and Throat Society was addressed, January 20, by Dr. Matthew S. Ersner, Philadelphia, on "Deafness: Whose Responsibility Is It? Is It a Lost Cause? Mode of Treatment."

Philadelphia

College of Pharmacy and Science Begins Accelerated Courses.—Consistent with the wartime policy of eliminating summer vacations in a scheduling of the eight semester curriculum leading to bachelor of science, the Philadelphia College of Pharmacy and Science will start its next freshman class on June 28. Assuming that the acceleration policy, which is a wartime adjustment, will continue operative throughout the eight semesters of the curriculum, the student entering this summer should qualify for graduation in April 1946. For the benefit of the applicants who may qualify for admission this spring and who are desirous of entering on their studies without delay and to complete the curriculum as soon as possible, the college will offer certain freshman courses, namely general chemistry, mathematics (college algebra and trigonometry), German, English composition and mechanical drawing in the spring semester, which begins March 1. These courses will be of collegiate grade and will lead to credits for advanced standing in any one of the four curriculums of pharmacy, chemistry, bacteriology and biology offered by the college.

Annual Report of Hospital Service.—The Associated Hospital Service of Philadelphia paid hospitals $2,361,936.06, or 78 per cent of its earned income in 1942, according to *Philadelphia Medicine*. This figure is an increase from $1,743,586.20, or 76 per cent, paid during 1941. Income from subscription fees came to $3,007,333.56, an increase from $2,283,987.93 earned the previous year. Balance added to reserves during 1942 was $285,098.03, or 95 per cent of income, bringing the hospital plan's total reserves against epidemics or other contingencies to about $1,200,000. The previous year, $271,470.82, or 11.9 per cent of income, was added to reserves. Operating expenses for 1942 totaled $370,983.11, or 12 per cent of income, as compared with $257,109.41, or 11 per cent, in 1941. At the present time about 450,000 subscribers are enrolled in the service through groups formed in seven thousand business firms and industries. More than 100,000 subscribers have been hospitalized during the four years of operation by the organization. Hospital admissions vary from 100 to 200 subscribers daily, and 1,800 subscribers are receiving care every day. Newly elected members of the board of directors include Percival E. Foerderer, a trustee of Jefferson Medical College of Philadelphia, Dr. Lucius R. Wilson, medical superintendent of the Protestant Episcopal Church, and Dr. William Bates, president of the Philadelphia County Medical Society.

RHODE ISLAND

Society News.—The Providence Medical Association was addressed at its annual meeting, January 4, among others by Drs. Kalei K. Gregory and William A. Horan, Providence, on "Acute Anterior Poliomyelitis—A Review of Essential Features" and "Some Impressions of the Kenny Treatment" respectively.——Dr. Meyer Saklad, Providence, addressed the annual meeting of the Memorial Hospital, Pawtucket, November 18, on "Progress in Anesthesia."

Dr. Gormly Honored by Dental Society.—Dr. Charles F. Gormly, Providence, was presented with the medal of award and accompanying citation of the Rhode Island State Dental Society on January 27 in acknowledgment of many services to the medical and dental professions. Dr. Gormly is president of the state medical society. The award is given to "one who through eminent service has promoted the advancement of dentistry or furthered its public appreciation."

TENNESSEE

State Meeting Canceled.—At a meeting of the board of trustees of the Tennessee State Medical Association, it was decided to cancel the annual session planned to be held in Nashville, April 13-15. A meeting of the house of delegates of the association will be called sometime in April, the exact dates to be announced later.

WEST VIRGINIA

Personal.—Dr. William C. D. McCuskey, Wheeling, has been appointed a member of the Public Health Council for the term ending June 30, 1945, succeeding Dr. Albert H. Hoge, Bluefield.

State Association Will Hold Annual Session. — The seventy-sixth annual meeting of the West Virginia State Medical Association will be held at Charleston, May 17-18, with headquarters at the Daniel Boone Hotel. Because of war conditions there will be no formal banquet or ball. The preconvention meeting of the council will be held on Sunday evening May 16 and will be followed by the first session of the house of delegates. The second session will be held the following day. Full scientific programs will be presented during the two day meeting.

GENERAL

Meetings Postponed.—The medical section of the American Life Convention will not hold its 1943 meeting, which was scheduled to be held in June.——The annual meeting of the American Urological Association, which was scheduled to be held at the Hotel Jefferson, St. Louis, May 31-June 3, has been canceled.

Snow Medal Awarded to Dr. Wilbur. — The William Freeman Snow Medal for distinguished service to humanity was awarded to Dr. Ray Lyman Wilbur, chancellor of Stanford University, Calif., during the annual dinner meeting of the American Social Hygiene Association February 1. The medal was awarded to Dr. Wilbur "in recognition of the outstanding work he has done to protect American youth from the ravages of social disease." Dr. Wilbur has been president of the American Social Hygiene Association since 1936.

New Publication on Dentistry.—Dr. Carl W. Waldron, Minneapolis, has been named editor of the new *Journal of Oral Surgery* to be published by the American Dental Association, and L. Pierce Anthony, D.D.S., editor of the *Journal of the American Dental Association*, has been named editor in chief. Dr. Waldron graduated at the University of Toronto Faculty of Medicine in 1911. He received his degree in dentistry at the Royal College of Dental Surgeons in 1913. He has been serving at the University of Minnesota School of Dentistry, Minneapolis, as professor of oral surgery and as professional lecturer in the school of medicine.

Hospital Association Creates Service Bureau. — The American Hospital Association has established a wartime service bureau and named Mr. James Russell Clark, Bay Shore, N. Y., as director. The service bureau is the result of action by the house of delegates of the association at its 1942 meeting in St. Louis, October 12-16. It will have headquarters in Washington and was expected to be in operation February 15. The wartime service bureau will be under the supervision of the council on government relations of the association, which Mr. Clark will also serve as secretary. Mr. Clark has for the past seven years been administering the Southside Hospital in Bay Shore. The new bureau is for service to the association and the hospital field in general and not to promote legislation.

Method for Determination of Cadmium. — *Industrial Hygiene* reports that a dithizone method for the determination of cadmium has been worked out by Alfred N. Setterlind, M.S., and Arthur H. Krause, B.S., Chicago, of the Illinois Division of Industrial Hygiene. The method is especially applicable to air samples. Accurate results may be obtained even in the presence of large quantities of other metals, such as zinc, lead and copper. Description of the procedure may be obtained in mimeographed form from the Division of Industrial Hygiene, Illinois State Department of Public Health, 1800 West Fillmore Street, Chicago.

Dr. Lela Booher Appointed Chief Nutritionist at General Mills.—Lela E. Booher, Ph.D., director of Institute of Nutrition at the Milwaukee Children's Hospital, Milwaukee, has been appointed chief nutritionist of General Mills, Inc., Minneapolis. Dr. Booher received her Ph.D. degree at Columbia University, New York, in 1928. She subsequently served as instructor in biochemistry at New York Post-Graduate Medical School, research assistant in chemistry at Columbia University, and biochemist at St. Lukes Hospital, Cleveland, returning to Columbia as instructor in chemistry, where she served from 1930 to 1936. She was chief of foods and nutrition, Bureau of Home Economics, U. S. Department of Agriculture, from 1936 to 1941. In 1938 she represented the United States at the Geneva Conference on Nutrition at the League of Nations.

Tips to Save Rubber.—The Bureau of Home Economics, Research Administration, U. S. Department of Agriculture, has recently issued a folder and a set of printed posters to help in the conservation of rubber. "Take Care of Household Rubber" is the title of the pamphlet, which tells in popular style how to make rubber last by right storage, by removing spots and by mending with a cold patch or hot patch when a first break appears. Single copies of the folder are available free on request from the Office of Information, U. S. Department of Agriculture, Washington, D. C. "Make Your Rubber Last" is the title and theme of the five printed posters which pictorially describe the story of care and repair. The posters, 14½ by 20 inches in size, are designated for use in class instruction or group meetings. They are available from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 10 cents a set. The set is especially helpful to nurses and others who handle supplies for the sick.

Special Society Elections. — Dr. E. Bishop Mumford, Indianapolis, was named president-elect of the American Academy of Orthopaedic Surgeons at its annual meeting in Chicago on January 17-20 and Dr. Marius N. Smith-Petersen, Boston, was installed as president. Other officers are Drs. Fremont A. Chandler, Chicago, treasurer; Arthur G. Davis, Erie, Pa., vice president; Myron O. Henry, Minneapolis, secretary, and Edward L. Compere, Chicago, librarian-historian.——Dr. C. Lydon Harrell, Norfolk, Va., was elected president of the Seaboard Medical Association at its annual meeting in Wilson, N. C., Dec. 1-3, 1942. Vice presidents are Drs. Malory A. Pittman, Wilson; Horace G. Ashburn, Norfolk; Thomas L. Lee, Kinston, N. C., and Oscar R. Yates, Suffolk, Va. Dr. Clarence P. Jones, Newport News, Va., was reelected secretary-treasurer. The forty-eighth annual meeting of the association will be held at the Hotel Jefferson, Richmond, Va., November 30-December 2.——Dr. Frederic Wertham, New York, was chosen president of the Association for the Advancement of Psychotherapy at its recent annual meeting, Dr. Joseph Wilder, New York, vice president and Dr. Emilian A. Gutheil, New York, secretary. Dr. Franz M. Groedel, New York, addressed the meeting on "Psychosomatic Relationships in Heart Disease."

Willard Gibbs Medal Awarded to Dr. Elvehjem.—The Chicago Section of the American Chemical Society has awarded its thirty-second Willard Gibbs Medal to Conrad A. Elvehjem, Ph.D., professor of biochemistry, University of Wisconsin, Madison, according to the *Chemical Bulletin*. The medal will be presented formally to Dr. Elvehjem during the meeting of the Chicago Section May 20. The medal, founded by the late William A. Converse, is given in special recognition of "eminent work in and original contributions to pure or applied chemistry." Dr. Elvehjem was born in McFarland, Wis., in 1901 and received his degree of doctor of philosophy at the University of Wisconsin in 1927. He has been a member of the faculty of the university since 1925, when he became instructor in biochemistry. He became assistant professor in 1930 after a year of study at Cambridge University, England, associate professor in 1932 and professor in 1936. He has been a member of the Council on Foods and Nutrition of the American Medical Association since 1942. Dr. Elvehjem was awarded the Gibbs Medal for his studies involving trace elements in nutrition, tissue respiration, B vitamins, miscellaneous studies in nicotinic acid, studies demonstrating that chick dermatitis is due to pantothenic acid deficiency and for studies on the newer members of the vitamin B complex now in progress.

Increase in Catastrophe Fatalities. — The *Statistical Bulletin* of the Metropolitan Life Insurance Company reports that the number of deaths occurring in catastrophes in 1942 totaled approximately 2,600, more than two and one-half times as many deaths as in 1941 catastrophes. The bulletin explains that catastrophes have been designated as those disasters in which the toll is at least 5 lives. In 1941 the largest single accident accounted for 37 deaths. In 1942 the most tragic accident was the Boston night club fire, in which 488 were killed. Two coal mine explosions, one in West Virginia and the other in Colorado, took 56 and 34 lives, respectively. There were 54 victims in an explosion at an ordnance plant in Illinois. Close to 50 persons died when sodium fluoride, mistaken for powdered milk, was used in the preparation of food at a mental disease hospital in Oregon. A double disaster, the sinking of a tanker and a barge on Lake Erie, took 32 lives. The premature explosion of tons of gelatinite at a quarry in Pennsylvania killed 31 men. Tornadoes claimed more lives in 1942 than in any of the preceding five years. Most disastrous were the tornadoes which took a toll of 111 lives in seven Southern and Midwestern states in March. Three series of tornadoes killed more than 100 persons in Oklahoma during the months of April to June. It is interesting to note, the bulletin states, that there were many serious catastrophes in 1917 also. An explosion in a Pennsylvania munitions plant in April 1917 took 112 lives. A copper mine

fire in Montana and coal mine explosions in Colorado and Kentucky took 163, 121 and 62 lives, respectively. There were a series of tornadoes toward the end of May of that year which killed 300 persons.

Noise Abatement Council Announces Achievement Awards for 1943.—Announcement is made of the National Noise Abatement Council Achievement Award competition for 1943. Four awards for outstanding achievement in the elimination of needless noise will be made this year, one in each of four city population groups, as follows: group 1, cities of over 500,000 population; group 2, cities of 250,000 to 500,000 population; group 3, cities of 100,000 to 250,000 population, and group 4, cities of less than 100,000 population. The awards will be given to the city in each group submitting on or before July 1, 1943 the most conclusive evidence of outstanding accomplishment during the period June 7, 1942 to June 5, 1943 in the abatement of unnecessary street noise and the control of industrial, office and in-the-house noises, and in the observance of National Noise Abatement Week, May 30 to June 5, 1943. Emphasized in the council's 1943 antinoise campaign and especially sought in this year's achievement award competition will be evidence of noise abatement activities directed toward the elimination of industrial, office and in-the-house noises as a civilian health and welfare measure for the conservation of manpower and to aid war production. The plaque that will be given to each of the winners, executed by Rene Paul Chambellan, sculptor, New York, symbolizes the war that is being waged against needless noise. The plaque depicts Aeneas, Trojan warrior hero of Virgil's "Aeneid," overcoming the many-headed monster Cerberus, who guarded the gates to Hades. Aeneas, who had gone there seeking counsel from his father, Anchises, as to the future fortunes of his race, is portrayed in the act of hurling bits of drugged food into the jaws of the beast. This, according to Virgil's tale, effectually quells Cerberus, who falls asleep. Material submitted as supporting evidence to claims for the awards must be received by the National Noise Abatement Council not later than July 1, 1943 and may consist of any or all of the following:

Newspaper Clippings: News, stories, photographs, cartoons, features and editorials.
Photographs: Of civic and special activities and window and store displays.
Scripts: Of radio announcements and programs, other talks and lectures.
Official Statements: Photostatic or other copies of proclamations and statements issued.
Posters—Car Cards: Samples or photographs with the number and method of distribution.
Record of Events: Dates, names and places—where and when events occurred.
Statement of Results: Official comment, safety and traffic records, other testimonials.
Miscellaneous: Any other material or evidence of a supporting nature.

Entries may be made by any city official or department, chamber of commerce, noise abatement committee or council or by any other representative civic group or organization. Material submitted cannot be returned and will become the property of the National Noise Abatement Council. The decisions of the National Noise Abatement Council's Committee on Awards will be final. Address entries to Committee on Awards, National Noise Abatement Council, 9 Rockefeller Plaza, New York.

Annual Report of the Commonwealth Fund.—According to its twenty-fourth annual report, the Commonwealth Fund expended $1,937,224 during the year ended Sept. 30, 1942. Of the total, $416,500 went to war relief, $343,788 to medical research, $63,648 to medical education, $462,203 to rural hospitals, $236,684 to public health, $21,678 to health studies, $117,044 to mental hygiene and $16,731 to mental hygiene in England. A total of $58,750 was used for research on problems of war medicine. A third of the undertakings aided during the year have a bearing on specific issues of war medicine. A new grant of $4,500 to the Long Island College of Medicine enabled the college to invite visiting instructors to participate in its teaching program. Dr. Thomas Addis, professor of medicine at Stanford University School of Medicine, San Francisco, stayed for a six weeks period, and members of the Cornell University Medical College assisted in the work in parasitology.

The report reviews the fund's help to projects in this country and England, pointing out that the Child Guidance Council had returned to London from its temporary quarters at Bath. Kay County, Okla., was selected for a second demonstration of county health department activities; Seminole County will receive assistance until July. Support for health department activities was discontinued in Jones County, Miss., and Sumner County, Tenn., and no further demonstrations of this type are contemplated for these states. The experimental subsidy to the East Alabama Health District, in which there was an advisory staff of specialists for an entire district, ended following the death of Dr. James N. Baker, on whose initiative the plan was launched. An increase was noted of about 8 per cent in the occupancy of the thirteen rural hospitals in eleven states assisted by the fund.

The last three of the fund's fellowships for British students terminated at the end of the last academic year; no further appointments will be made for the duration of the war. However, the fund offered a new group of fellowships to physicians, sanitary officers, technicians or public health nurses chosen in cooperation with medical and health authorities of the Latin American nations and with the advice and assistance of the Pan American Sanitary Bureau. Fifteen of these fellowships went to representatives of Argentina, Brazil, Chile, Costa Rica, Cuba, Guatemala, Honduras, Paraguay and Peru.

A plan to expend the psychiatric service in the department of medicine at the Peter Bent Brigham Hospital, Boston, was discontinued on the death of Dr. Soma Weiss, physician in chief at the hospital, and the resignation of Dr. John Romano, the psychiatrist, to become professor of psychiatry at the University of Cincinnati School of Medicine. Additional internships were established at the Payne Whitney Psychiatric Clinic of the New York Hospital to supplement similar assistance at the Henry Phipps Psychiatric Clinic at Johns Hopkins University and the Colorado Psychopathic Hospital. Noteworthy contributions to the bacteriologic control of communicable disease likely to be prevalent in armies have been made through the study of bacterial nutritive requirements at Harvard, and the epidemiologic study of poliomyelitis there helped to win general medical support for one preventive measure—the postponement of tonsillectomies beyond the season when paralytic poliomyelitis is most common. At New York Hospital an analysis of hereditary factors in the incidence of rheumatic fever reached the conclusion that the disease follows a predictable pattern of genetic susceptibility.

CANADA

Honor Memory of Sir Frederick Banting.—The chancellor and president of the University of Toronto and members of the university staff accompanied Lady Banting to Mount Pleasant Cemetery recently to place a wreath on Sir Frederick's tomb. The occasion marked the fifty-first birthday anniversary of Sir Frederick, co-discoverer of insulin. The *Canadian Medical Association Journal* reports that this may become an annual ceremony.

Changes in Faculty at University of Alberta.—Dr. John Ross Vant has been named head of the department of obstetrics and gynecology at the University of Alberta Faculty of Medicine, Edmonton, and Dr. Jermyn O. Baker has been named professor in the department. The announcement that appeared in THE JOURNAL, Dec. 19, 1942, page 1329, and listed Dr. Vant as professor of obstetrics and gynecology and Dr. Baker as associate professor was taken from the *Canadian Medical Association Journal*, November 1942, page 492.

FOREIGN

Planning for Science.—The Association of Scientific Workers in Great Britain organized a conference held on January 30 and 31 on the planning of science in war and peace. Consideration was given to plans of the United States of America and of Russia for the organization of research in the war and postwar periods. Special attention was given also to reorientation of science after the war.

Government Services

Dr. Dyer Heads New Committee for Typhus and Rickettsial Diseases

Dr. Rolla E. Dyer, assistant director of the National Institute of Health, Bethesda, Md., has accepted the chairmanship of a committee of the Pan American Sanitary Bureau for study of typhus and rickettsial diseases. According to *Military Surgeon*, creation of this committee was recommended at the eleventh Pan American Sanitary Conference held at Rio de Janeiro, Brazil, Sept. 7-18, 1942. The particular purpose is "to determine the different varieties of typhus virus existing in each country with a view of obtaining better resources for vaccination, to study the reservoirs and vectors of virus in each country and to submit the conclusions of these studies to the proper conference."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 2, 1943.

Elaborate New System for the Treatment of Injuries

The Emergency Hospital Service, referred to from time to time in previous letters to THE JOURNAL, was originally intended for the treatment of casualties from air raids and other work in connection with the war. It has now a much larger scope. It has established a large scale orthopedic and fracture treatment service with facilities for rehabilitation. Manual workers in "war industry"—a term widely interpreted to include munition work, shipbuilding and repairing, building and civil engineering, mining, agriculture, fishing, public utility undertakings, shipping and transport—are entitled to treatment. The injury need not have been suffered during employment. This new service is maintained by a series of graded hospitals. In England and Wales there are twenty-one orthopedic centers for complicated cases, sixty fracture departments for cases less complicated but requiring long treatment, two hundred hospitals for short stay cases and fracture clinics for follow-up treatment. The orthopedic centers provide the full continuity of treatment and rehabilitation service, including all aspects of specialist treatment from the original resetting of the injury, through physical therapy and remedial exercises and games to complete occupational therapy.

The fracture departments are divided into two classes. Fracture departments of the A class are similar in conception to the orthopedic centers and deal with long stay cases and rehabilitation, but differ in not handling the more complicated cases, which are transferred to those centers, and in not including full workshop occupation, though providing occupational therapy of a handicraft type and covering all ordinary massage, exercise and physical therapy. They also provide for full continuity of specialist treatment. Hospitals suited by specialist service and equipment to cooperate in the fracture service are classified as B because their situation in areas vulnerable to air attack is unsuited to the smooth treatment of long stay cases. They are used for short stay cases or ambulant cases.

Provision is made for follow-up treatment after the patient's discharge from the hospital. Orthopedic centers and fracture departments have outpatient services where after-care, massage and physical therapy are provided. To fill up gaps and enable service to be given nearer home where possible, use is made of a number of selected clinics and hospitals able to give suitable service on the prescription of the surgeon who originally attended the injury.

Claim of Women for Compensation

Attacks from the air on this country have resulted in a large number of civilian casualties, for which the government pays compensation. In the House of Commons Mrs. Tate moved an amendment to the address expressing regret that the same rate of compensation was not paid to women as to men. These pensions were paid from taxation, to which women paid at the same rate as men. Replying for the government, Mr. Attlee said that the appeal for equal compensation for civilian war injuries was a strong one. It was based on the principle of equal injury, but in this country we had a system based on a different principle, namely the earnings of injured persons. Workmen's compensation was based on this. Compensation for civil defense workers, including compensation for accidents on duty, would ordinarily come under workers' compensation. In practice payments were made to men and women in civil defense on the basis of a maximum of six months' whole time pay. In the services the pay of men and women was different and the compensation differed accordingly. Compensation was not given as an injury allowance; there was a pension for total disability. For civil defense workers and for the uniformed services pensions were the same in the basic grades but differed for men and women. If it was proposed that civil defense workers should be given equality as between the sexes, the same would have to be done for the armed forces. A change of such magnitude should not be taken on one afternoon's debate in the House. The government proposed that a select committee should be set up to report on the proposal that civilian women should be compensated equally with civilian men for war injuries, on the general principles of compensation and on the levels of remuneration. The question could not be settled on an abstract principle.

In the debate which followed, support and opposition did not follow party lines but cut across them. A point was made of the great services rendered by women in this war, which far surpassed those of the last war. The amendment was negatived by 229 votes to 95.

American Blinded Soldiers to Be Cared for in St. Dunstan's

At a luncheon given by St. Dunstan's Institute for fighting men blinded in the war the principal guests were Brigadier General Hawley, chief surgeon of the Army of the United States in the European theater of operations, and Brigadier R. M. Luton, director of medical services, Canadian military headquarters. Mr. Ernest Brown, minister of health, said that in the field of medicine and surgery a happy comradeship between the English speaking allies had developed since the war began. The most recent example of Anglo-American cooperation was that St. Dunstan's had just concluded an arrangement under which American soldiers blinded in the war would be cared for in St. Dunstan's Hospital and Training Center while awaiting evacuation, and British casualties across the Atlantic would be similarly treated by the Americans. In the early days of the war American doctors came at their own expense and without remuneration to help in our hospitals. When American forces began to reach this country we arranged that they, as well as other American nationals needing treatment, should be accommodated in our emergency hospitals. In addition, the Ministry of Health had handed over to the Americans five new fully equipped hospitals.

Age for Calling Up Recruits Lowered

The calling up age of young men for the army has been lowered from 18 years to 17 years and 8 months. But the age of liability for military service remains the same, 18 years, and also the youngest age for sending men overseas, which is 19 years. The object is to provide a longer period of training. The government endeavored to postpone the date of calling up young persons of the minimum age as long as possible, but the manpower situation compelled this new measure. It is held that this war cannot be won with a mass produced army; individual action by the soldier is necessary. It is therefore an advantage to give recruits the longest possible training in this country before they are sent overseas and to make them fit for the strenuous battles they will be called on to face.

The Importance of Preventive Medicine

Addressing the Congress of the British Medical Students' Association, Mr. Ernest Brown, minister of health, said that the air was full of new ideas and new trends but that there was one we should keep constantly in front of us—preventive medicine and positive health. The age long function of the physician was to cure and relieve the sick. But it was right

that the minister of health (not minister of disease) should insist on a second duty—to prevent disease and point the way to positive health. In this second battle the doctors of the future would not be alone. They would form part of a great army of workers—nurses, teachers, engineers and architects—who were anxious to prevent disease and took for their motto "Prevention is better than cure." In their clinical work his audience would try to make a diagnosis at the earliest possible stage and to push back the diagnosis until the first tiny flowering of disease could be detected and nipped in the bud. If they carried this a stage further they would find themselves preventing disease before it had shown itself. Perhaps the greatest handicap in the practice of preventive medicine today is not that we do not know how to prevent many diseases but that the public does not take full advantage of the knowledge we have. A "doctor" originally meant a teacher. We looked to doctors to teach and lead the public so that valuable lives were not lost through ignorance of the means of prevention.

TEL-AVIV, PALESTINE

(From Our Regular Correspondent)

Dec. 25, 1942.

Child Mortality in Egypt

From reports of the Research committee organized by the Egyptian Health Department to investigate child mortality rates, it is learned that the average annual births for the last few years have been approximately 650,000 and deaths 430,000, 240,000 of the latter being of children: 110,000 babies under 1 year and 130,000 from 1 to 5 years old. One third of the newborn babies of Egypt die, therefore, before reaching the age of 5, while half of this number die during their first year. This high incidence of mortality tells a sad story of a diseased and suffering childhood.

The average death rates per thousand births are:

In the Years	Urban	Rural	The Whole Country
1921-1925	261	130	144
1926-1930	217	138	152
1931-1935	207	147	165
1936	205	150	164
1937	206	149	165

as compared with Austria 81, India 162, Belgium 80, Bulgaria 150, Germany 64, Italy 100, England 58, and Japan 106 in 1937.

The incidence of mortality in rural communities has been growing with the years. The high figures are partly due to the increasing registration of deaths in the villages since the habit of secret interment has decreased; but there may be also an actual increase in the number of deaths owing to the low social and economic standard of the peasantry.

The incidence of child mortality in Egypt has been much higher than in many poorer countries that have a lower cultural standard. These high death rates are caused primarily by hunger, deprivation, ignorance, uninstructed motherhood and too great a number of births especially among destitute families, the results of which are malnutrition, poor housing accommodation, hard labor for women resulting in the deterioration of the body, mind and lung defects, diseases of the stomach and hereditary diseases. To this must be added the ignorance of the midwives and the few maternity and child welfare institutions.

The falling in the number of cases of infant mortality in the cities during the 1936-1940 period was to some extent due to improvement in the general health conditions of the city population and the establishment of infant welfare stations.

Welfare of Children in Wartime

The medical institution of Hadassah is conducting a network of school luncheons throughout the country. This work was first started in 1923 but in the last few years has developed with great strides. Through these school luncheons the hungry and needy children, selected by the school nurse in the schools and kindergartens subsidized, are given one nourishing meal a day. The meal, which costs 12 mils (5 cents), contains three dishes and is planned in such a way as to provide from 30 to 40 per cent of the daily food requirement of a child 10 years of age.

In seventy-eight of these schools the work is done on an educational basis; i. e., a cooking teacher gives instruction in cooking to rotating groups of 8 to 10 pupils, who under her guidance prepare a daily luncheon for between 150 and 300 of the neediest of their fellow pupils. The cooking teacher also gives instruction in nutrition in the classroom to the seventh and eighth grade pupils. In the year 1940-1941 this work was conducted in 5 towns and 47 settlements in Palestine. There also exists a central kitchen in each of the two main towns (Jerusalem and Tel-Aviv) sending out 3,000 and 1,200 meals respectively to different schools. From school kitchens where cooking teachers are employed meals are also sent out to neighboring schools without cooking teachers. In this way a total of 248 schools (of which 78 were with cooking teachers) and 52 kindergartens were reached.

The number of children fed in all these institutions was 25,385, and the total number of workers engaged in the project was 308. The total yearly budget involved was nearly £75,000, of which about £25,000 was contributed by Hadassah, the Women's Zionist Organization of America and £10,000 by the General Council (Vaad Leumi) of the Jewish Community of Palestine out of the government grant, while the remaining budget of about £40,000 was covered by contributions of the Tel-Aviv municipality, local councils, local feeding committees and parents' committees, as well as by children's payments for meals.

Vaccination Against Jericho Boil (Aleppo Boil)

The Palestine Potash Company, Limited, and Kupat Holim (Palestine Jewish Workmen's Sick Fund) have worked long in their search for means of combating the Jericho boil. Thanks to the keen interest and assistance given by Professor Adler of the Hebrew University a vaccine has been provided and all the workers of the potash plant have been inoculated by the Kupat Holim physician Dr. Katzenellenbogen. The results of this inoculation were described by Dr. Katzenellenbogen in the 1942 issue of the Hebrew medical journal *Harefua.*

It was decided to inoculate a number of noninfected recent arrivals and noninfected residents with living virus. Material used for inoculation consisted both of cultures of Leishmania tropica on Locke-serum-agar isolated from a local case and Leishman-Donovan bodies of the same strain from the spleens of infected Syrian hamsters. The animals were infected by inoculating cultures directly into the spleen as described by Adler and Ashbel (*Ann. Trop. Med.* **34**:207 [Dec.] 1940). Inoculations were made on the anterior surface of the thigh about 10 cm. above the knee; 0.2 cc. in the case of culture and 0.05 cc. of emulsion in the case of Leishman-Donovan bodies were injected intradermally. A total of 167 persons were inoculated, 82 with Leishman-Donovan bodies and 85 with cultures; 152 cases were observed for a period of six to ten months.

The incubation period varied from less than two weeks to more than two months. In 7 cases lesions appeared both on the site of inoculation and on remote sites (the neck, face and arms) and it is believed that in these cases the inoculation

was made during the incubation period of natural infection. Reinfection succeeded in 1 case out of 13 tested. With the exception of the 7 cases in which inoculation was done during the inoculation period of natural infection, none of the incubated cases showed any lesion apart from the experimental sore on the left thigh. Twenty cases were tested by intradermal inoculation of 100,000 dead flagellates shortly after Leishman-Donovan bodies were found in the experimental lesions. In 18 a positive reaction was observed within forty-eight hours. Ten cases were similarly tested during the incubation period and in all of them the reaction was negative. The effects of vaccination are indisputable, and all persons entering hyperendemic centers and noninfected residents should be vaccinated preferably shortly after the termination of the sandfly season. The inoculation of some persons during the incubation period of a natural infection is inevitable, but they are none the worse for an additional sore in an unexposed part and all other persons are spared unsightly scars in exposed parts. It was also noted that Leishman-Donovan bodies from the spleens of infected hamsters produced only local cutaneous lesions in human beings without any evidence of visceral involvement.

BRAZIL

(From Our Regular Correspondent)

Jan. 9, 1943.

Inoculation of Killed BCG Vaccine for the Early Diagnosis of Tuberculosis in Infants

As previously reported in THE JOURNAL, Dr. Arlindo de Assis of the Viscondessa de Morais Tuberculosis Institute of Rio de Janeiro has been carrying out extensive studies on the pathogenicity of the BCG vaccine and on the human conditions described by Sayé, Saenz, Sayago and others as "infratuberculin allergy," a state closely related to the so-called latent allergy of tuberculous guinea pigs, after Willis. These scientific investigations promise to have practical significance in the near future. In a paper in collaboration with Dr. Alvimar de Carvalho of the same institute (THE JOURNAL, Nov. 28, 1942, p. 1053) Dr. de Assis reported his attempts to establish the foundation of a standard technic to ascertain the condition of infratuberculin allergy in man. He pointed out the behavior of the skin of normal children, i. e. without tuberculosis, when inoculated with 0.1 mg. of BCG vaccine killed by heating at 65 C. In a new paper Dr. de Assis gives an account of the results of the study of the apparently anallergic reactions in 8 children, as they did not react at first to the highest dose of tuberculin (10 mg.) intradermally. Nevertheless, further observation of the patients demonstrated that in reality they all harbored virulent tubercle bacilli at the time they first were tested with tuberculin. In all these children the classic allergy was in course of preparation, but the use of the killed BCG vaccine had as a consequence the disclosure of this preparatory condition, rapidly going over all the stages of the so-called "preallergic period" and immediately betraying the existence of a virulent infection. The new work of Dr. de Assis is quite different from several contributions previously reported in the medical literature because it has the essential character of revealing the initial stages of the allergic impregnation, during the course of the tuberculous infection, and not the mere disclosure of the residual vestiges of an extinguished infection.

The 8 children, whose ages varied from 1 to 7 years, were first submitted to the tuberculin diagnostic test and found anallergic and then received intradermically 0.1 mg. of killed BCG vaccine. During the subsequent period they were carefully studied by means of clinical, bacteriologic, radiographic and allergic examinations. Contrary to what happens in nontuberculosis infected children, Dr. de Assis's patients showed precocious and intense nodular reactions at the place of the BCG inoculations. During the first two weeks all these nodular foci had a diameter of more than 5 mm. and some of them, also at this early stage, presented caseation. In 3 of the cases the nodular reactions were related to the tuberculin type, considerably increasing during forty-eight to ninety-six hours, then decreasing, and later increasing again. Moreover, in 4 cases postvaccinal tuberculin allergy appeared within eight days, as characterizes the Willis-Sayé phenomenon. In 4 of the remaining cases this tuberculin veering occurred late, but its features of intensity and duration, together with other factors for the study of each case, were sufficient to prove that the interpretation had to be the same as in the other 4 cases. As in individuals in early infancy without any history of manifest tuberculous disease or history of BCG immunization, the nodular and tuberculin Willis-Sayé reactions have been considered as revealing virulent tuberculosis eventually in the preallergic period. In 4 cases the inoculation of the gastric washings in guinea pigs has proved that the hypothesis was correct. In the remaining 4 the study of the successive roentgenograms, the clinical symptoms and the home investigations, as well as the features of tuberculin allergy, proved also that the existence of virulent tuberculous infection was practically a certainty.

In conclusion, Dr. de Assis's work proves that, during the course of the tuberculosis primary infection of infancy, the tuberculin allergy of the skin is established progressively through a preallergic period the presence of which had not previously been demonstrated. The intradermal inoculation of dead bodies of the tubercle bacillus (0.1 mg. of BCG vaccine killed by heating) in children who are in the preallergic period is accompanied by specific and characteristic reactions that permit the recognition of the preexistence of a virulent tuberculous infection before the appearance of cutaneous allergy and consequently of the x-ray signs and the local and general clinical symptoms.

Association of Thiamine and Riboflavin to Stimulate Growth

Dr. Moura Campos, professor of physiology at the University of São Paulo, is carrying out a series of investigations on the vitamin content of Brazilian foods and on the practical importance of the different vitamins. In a recent paper he reported his work showing that thiamine and riboflavin act in association to help in the utilization of the food material by stimulation of the appetite and increase of the food assimilation. Dr. Campos's experiments have shown that the presence of thiamine is necessary to the utilization of riboflavin. Thiamine alone cannot maintain the growing capacity. Mandioquinha (Chaerophyllum bulbosum) has riboflavin but does not contain thiamine. Goiaba (Psidium guajava) presents both thiamine and riboflavin. These foodstuffs produced clear positive and negative results in the experiments, the growth of the rats being maintained well when the animals were fed on the latter fruit alone.

Marriages

JULIAN PATTERSON HARDY, Newala, Ala., to Miss Marion Frances Doughty of Tuscaloosa, recently.

ORVILLE PATTON STONE to Miss Hazel Louise Woodcock, both of New Orleans, December 18.

ROBERT DEWEY SANDERS, Victoria, Texas, to Miss Helen Mathias in Houston, February 6.

VINCENT J. THACKER, Dothan, Ala., to Miss Nettie M. Smith of Troy, November 24.

FRANK J. CERNY, Berwyn, Ill., to Miss Viola McNeel in Chicago, November 8.

DALE A. ROLD to Miss Mary Louise Stropes, both of Chicago, December 23.

Deaths

Hermann Johannes Boldt ✠ White Plains, N. Y.; University of the City of New York Medical Department, New York, 1879; formerly a pharmacist; emeritus professor of gynecology at the New York Post-Graduate Medical School, where he had been professor of gynecology from 1891 to 1917; consulting gynecologist to the New York Post-Graduate Medical School and Hospital, Stuyvesant Polyclinic, St. Vincent's, Beth Israel and Union hospitals; member of the Southern Surgical Association; one of the founders, formerly a member of the board of governors and fellow of the American College of Surgeons; honorary member of the American Gynecological Society, the American Gynecologic Club, Gynecological Society of Great Britain and the Westchester Surgical Society; member of the National Society of Sciences, New York Academy of Sciences, Association of Military Surgeons of the United States, New York Academy of Medicine and Royal Society of Medicine, London; extensive investigator into physiologic action of cocaine and gynecologic pathology; inventor of an operating table for abdominal surgery which won a medal at the Paris exposition in 1900, and also a modern examining table for office work; aged 86; died accidentally, January 12, in a hotel at St. Petersburg, Fla., of fumes from a small heater.

William Launcelot Brown ✠ El Paso, Texas; Rush Medical College, Chicago, 1896; an Affiliate Fellow of the American Medical Association and in 1911 a member of its House of Delegates; fellow of the American College of Surgeons; honorary life president of the Southwestern Medical Association, of which he was a founder many years ago; served as chief surgeon of the El Paso and Southwestern Railroad and later consulting surgeon of the Southern Pacific Railway System; aged 69; on the staff of the Hotel Dieu, Sisters' Hospital, where he died, December 28, of shock and hypostatic pneumonia caused by a fractured rib from an accidental fall.

James Lindsay Andrews, Memphis, Tenn.; Memphis Hospital Medical College, 1895; member of the Tennessee State Medical Association; past president of the Memphis and Shelby County Medical Association; served as surgeon on a British transport during the Boer War and was a major in the medical corps of the U. S. Army during World War I; formerly professor of obstetrics at his alma mater; at one time president of the city health department; in 1922 became medical director of the Columbian Mutual Life Insurance Company; aged 67; died, January 10, in the Baptist Memorial Hospital of cerebral embolus.

William Lloyd James ✠ Newark, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1921; specialist certified by the American Board of Urology, Inc.; member of the American Urological Association; fellow of the American College of Surgeons; assistant urologist, Newark City Hospital, the Babies' Hospital-Coit Memorial and the Presbyterian Hospital; chief, genitourinary clinic, Newark City Dispensary; attending urologist, St. Mary's Hospital, Passaic; aged 46; chief of the genitourinary clinic and assistant urologist to the Newark Memorial Hospital, where he died, January 10, of uremia.

Robert Earl Watkins ✠ Belmar, N. J.; Jefferson Medical College of Philadelphia, 1917; served in the U. S. Navy during World War I; past president and treasurer of the Monmouth County Medical Society; served as a member of the board of education of Belmar, school physician for Wall township and Spring Lake Heights; a member of the board of governors of Allenwood (N. J.) Sanatorium and Monmouth County Hospital for Tuberculosis; aged 51; on the staff of the Fitkin Memorial Hospital, Neptune, where he died, December 23, of multiple sarcoma.

Edward Lieurance, Warmsprings, Mont.; Medico-Chirurgical College of Kansas City, Mo., 1903; past president and charter member of the Mount Powell Tri-County Medical Society; member of the Montana State Medical Association; veteran of the Spanish-American War and World War I; served for many years as medical officer of Crow Indian Reservation; assistant superintendent of the Montana State Hospital for thirteen years, and a member of the resident staff since 1924; aged 63; died, January 2, of chronic diabetes and acute pyelonephritis.

William P. Adamson ✠ Tampa, Fla.; University of Georgia Medical Department, Augusta, 1900; member of the House of Delegates of the American Medical Association in 1929; in 1920 president of the Florida Medical Association and in 1911 president of the Hillsborough County Medical Society; recently a member of the district number 7 state welfare board and district draft appeal board; chairman of the health service committee of the chamber of commerce of Tampa; aged 68; died, January 3, of acute coronary thrombosis.

David Andrew ✠ Salt Lake City; Jefferson Medical College of Philadelphia, 1910; consultant in gynecologic surgery on the staff of the Dr. W. H. Groves Latter-Day Saints Hospital, where he had served in various capacities; aged 65; died, December 25, of coronary occlusion.

William Woodard Applewhite, Bassfield, Miss.; Memphis (Tenn.) Hospital Medical College, 1888; aged 84; died, December 21, at a hospital in Hattiesburg of chronic valvular heart disease and chronic nephritis.

Samuel Barris ✠ Long Beach, N. Y.; Baltimore University School of Medicine, 1900; aged 73; died, December 11, in the Park East Hospital, New York, of cerebral hemorrhage.

James P. Blake, Harrison, Maine; Medical School of Maine, Portland, 1892; member of the Maine Medical Association and in June 1942 was presented with the association's gold medal in recognition of his fifty years in the practice of medicine; aged 77; died, December 8, in a hospital at Portland of carcinoma of the colon.

Walter Boone ✠ Gaffney, S. C.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1919; formerly county health officer; served during World War I; aged 49; died, January 1, of a self-inflicted bullet wound.

Adda T. Hedges Brady, Sierra Madre, Calif.; Cleveland University of Medicine and Surgery, 1897; aged 82; died, December 24, of cerebral hemorrhage.

Joseph William Browning, Exeter, Ont.; Canada; Victoria University Medical Department, Coburg, 1867; aged 99; died, December 20.

Joseph Carlucci, Tuckahoe, N. Y.; New York University Medical College, New York, 1897; at one time served as physician for the Monroe County Penitentiary at Rochester; aged 73; died, December 10, in St. John's Riverside Hospital, Yonkers.

Bedau A. Cole, Thorp, Wis.; Hahnemann Medical College and Hospital, Chicago, 1883; aged 85; died, December 15, of cerebral hemorrhage.

Charles Thomas Crance ✠ North Tonawanda, N. Y.; University of Buffalo School of Medicine, 1900; fellow of the American College of Surgeons; formerly city physician; aged 64; died, December 26, in the Buffalo (N. Y.) General Hospital of bronchopneumonia.

Herbert Hazeltine Frothingham, Long Beach, Calif.; Chicago Medical College, 1885; for many years a practitioner in Chicago, where he was at one time a demonstrator and lecturer in anatomy at his alma mater; served during World War I; aged 80; died, January 7, in St. Mary's Long Beach Hospital of bronchopneumonia.

Edwin Forrest James, Springfield, Mo.; Beaumont Hospital Medical College, St. Louis, 1895; also a pharmacist; member of the Missouri State Medical Association; past president of the Greene County Medical Society; served as a captain in the medical corps of the U. S. Army during World War I; at one time city health officer; aged 72; died, December 18, in the Burge Hospital of cerebral hemorrhage.

Jesse Isaac Jones ✠ Manchester, Iowa; Ohio State University College of Homeopathic Medicine, Columbus, 1920; past president of the Delaware County Medical Society; served in the medical corps of the U. S. Army during World War I; medical superintendent and part owner of the Jones-Clark Hospital; aged 49; died suddenly, December 28, of coronary occlusion.

John Marion Langsdale ✠ Kansas City, Mo.; Missouri Medical College, St. Louis, 1878; at one time served as coroner of Jackson County and as city physician of Kansas City; formerly lecturer on genitourinary surgery at the University Medical College of Kansas City; aged 86; died, December 22, in the Wesley Hospital of coronary occlusion.

George Washington Lawhorn, Columbia, Mo.; University of Missouri School of Medicine, Columbia, 1883; Bellevue Hospital Medical College, New York, 1884; aged 80; died, December 24, of arteriosclerosis.

Herbert Everett Long, San Francisco; University of California Medical School, San Francisco, 1912; aged 56; died, December 29, in the Franklin Hospital of acute coronary occlusion.

Frank Samuel Lovering, Moultonboro, N. H.; Dartmouth Medical School, Hanover, 1884; member of the New Hampshire Medical Society; school physician and for many years a member of the local school board; was chairman of the town welfare board; aged 81; died, December 25, in the Huggins Hospital, Wolfeboro, of empyema of the gallbladder.

Albert L. McClard, Newark, Ark. (licensed in Arkansas in 1903); aged 75; died, December 14, of pneumonia.

Charles M. Mickle, Texas, Ga.; Medical College of Alabama, Mobile, 1890; served as vice president and a director in the Bank of Heard County; at one time county commissioner and state senator; aged 76; died, November 9, of nephritis and senile gangrene.

Walter McNab Miller, Columbia, Mo.; Cooper Medical College, San Francisco, 1895; member of the Missouri State Medical Association; at one time professor of pathology and bacteriology at the University of Missouri School of Medicine; served as secretary of the Missouri State Tuberculosis Society and of the State Tuberculosis Sanatorium board; formerly pathologist to the Parker Memorial Hospital; aged 83; died, December 13, in Kansas City.

John Franklin Myers ✠ Sodus, N. Y.; College of Physicians and Surgeons, New York, 1887; for twenty-seven years a member of the board of education of Sodus; founder and owner of the J. F. Myers Hospital; aged 79; died, December 25, of coronary thrombosis.

James Slaughter Norton, Sayreton, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1908; member of the Medical Association of the State of Alabama; for many years physician for the Republic Steel Company; aged 59; died, December 27, in Birmingham of angina pectoris.

C. W. Oliver, Jonesboro, Ark. (licensed in Arkansas in 1903); aged 74; died, December 16, in St. Bernard's Hospital of paralysis agitans.

Ermin Anthony Pautler ◔ Red Bud, Ill.; St. Louis University School of Medicine, 1926; on the staff of St. Clement's Hospital; aged 41; died, January 3, in St. Mary's Hospital, St. Louis, of hypertensive cardiovascular disease.

Eber Reeves, Oberlin, Kan.; Central Medical College of St. Joseph, Mo., 1905; aged 63; died, November 7, of diabetes mellitus and tuberculosis of the skin.

Harry Kelchner Reynolds, Brooklyn; University and Bellevue Hospital Medical College, New York, 1900; member of the Medical Society of the State of New York; formerly on the staff of the Prospect Heights Hospital and on the courtesy staff of the Brooklyn Hospital; aged 57; died, December 29, of cerebral thrombosis.

Albert Henry Rondeau, Winnipeg, Man., Canada; Manitoba Medical College, Winnipeg, 1905; aged 61; died, December 11, in the Winnipeg General Hospital of pneumonia and hypertension.

John Henry Rorke ✠ Reading, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; fellow of the American College of Surgeons; served during World War I; formerly served as county coroner and as city councilman; for many years a member of the staff of St. Joseph Hospital; since 1933 a member of the board of trustees of Albright College; aged 64; died, December 27, of coronary occlusion.

David Rose, Sebastian, Fla.; Victoria University Medical Department, Coburg, Ont., Canada, 1882; member of the Florida Medical Association; for many years served as local registrar for vital statistics in his district; aged 88; died, December 5, in the Indian River Hospital, Vero Beach, of senility.

Arthur Sylvester Ruland, Syracuse, N. Y.; Syracuse University College of Medicine, 1894; member of the Medical Society of the State of New York; for many years a member of the staff of the Crouse-Irving Hospital; served as a captain in the medical corps of the U. S. Army during World War I; aged 74; died, December 23, of cerebral hemorrhage.

Charles H. Rupprecht, Calumet, Mich.; Michigan College of Medicine and Surgery, Detroit, 1895; member of the Michigan State Medical Society; member of the staff of the Calumet Public Hospital, Laurium; aged 73; died, December 8, of carcinoma of the large intestine.

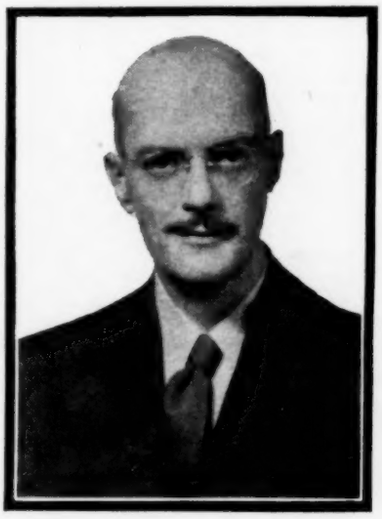
Leslie Tanguary Rusmiselle, Washington, D. C.; College of Physicians and Surgeons, Baltimore, 1913; member of the Medical Society of the District of Columbia; served as a major in the medical corps of the U. S. Army during World War I; aged 54; died, December 26, of carcinoma.

Aaron Leidy Ruth, Conshohocken, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1912; member of the Medical Society of the State of Pennsylvania; served during World War I; a trustee of the Norristown (Pa.) State Hospital; aged 56; on the staff of the Lankenau Hospital, Philadelphia, where he died, December 24, of cerebral thrombosis.

Harry Bayliss Stokes ✠ Omaha; University of Michigan Medical School, Ann Arbor, 1929; member of the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; major in the medical corps, Army of the United States; stationed for a short time at Fitzsimons General Hospital, Denver; aged 38; was killed in action in the North African area, January 2.

Harry Eugene Teasley ✠ Robinson, Ill.; Tulane University of Louisiana School of Medicine, New Orleans, 1928; formerly instructor in bacteriology and pathology at the Emory University (Ga.) School of Medicine and instructor in bacteriology at the University of Colorado School of Medicine, Denver; appointed a major in the medical corps of the Army of the United States Oct. 27, 1942; aged 40; died, November 22, near Orlando, Fla., of heart disease.

KILLED IN ACTION



HARRY BAYLISS STOKES
Major, M. C., A. U. S., 1904-1943

Cecil Judson Vaughn, Luverne, Ala.; University of Louisville (Ky.) School of Medicine, 1930; member of the Medical Association of the State of Alabama; at one time health officer of Holmes County, Miss.; aged 36; died, December 31, in the Newell and Newell Sanitarium, Chattanooga, Tenn., of poisoning by mercury bichloride.

John Armstead Winstead, Raleigh, N. C.; North Carolina Medical College, Charlotte, 1914; specialist certified by the American Board of Pediatrics, Inc.; served as a captain in the medical corps of the U. S. Army during World War I; for many years on the staff of the Park View Hospital, Rocky Mount; since Oct. 16, 1940 had been on the staff of the North Carolina State Board of Health as senior examining physician, division of industrial hygiene; aged 53; died, December 25, of coronary occlusion.

Robert James Wiseman, Lewiston, Maine; Medical School of Maine, Portland, 1903; member of the Maine Medical Association; also a druggist; served as mayor of Lewiston for many years; aged 71; on the staff of St. Mary's General Hospital, where he died, November 20, of lymphosarcoma.

DIED WHILE IN MILITARY SERVICE

Maurice Anthony Bisson, St. Albans, Vt.; University of Vermont College of Medicine, Burlington, 1933; member of the Vermont State Medical Society; fellow of the American College of Surgeons; surgeon on the staff of St. Albans Hospital; was called to active duty as a captain in the medical corps of the Army of the United States on July 27, 1942; aged 33; died, January 1, in Fort Devens, Ayer, Mass., of myeloid sarcoma with metastasis.

Joseph Dillon Jr., Sacramento, Calif.; Columbia University College of Physicians and Surgeons, New York, 1932; member of the California Medical Association; lieutenant in the medical corps of the U. S. Naval Reserve; began active duty March 18, 1942; aged 36; died, December 6, of heart disease while at sea.

A. Edgar Wrightman Jr., Portland, Ore.; University of Oregon Medical School, Portland, 1931; began active duty in June 1942 as a first lieutenant in the medical corps of the Army of the United States; aged 37; died in December in an airplane accident at Tampa, Fla.

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D. D. N. J. and foods, F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Black Tablets for Kidneys, Bladder and Ureters.—W. B. Goebel, trading as Botanical Medicine Company, Kannapolis, N. C. Shipped between June 7 and 10, 1940. Composition: compounds of magnesium and aluminum, cubeb, copaiba, methyl salicylate and sugar. Misbranded because falsely represented on label to be efficacious for the conditions suggested by the name of the product, whereas they were not.—[*D. D. N. J., F. D. C. 426; September 1942.*]

Catawba's Bu-Q-Ju Diuretic.—W. B. Goebel, trading as Botanical Medicine Company, Kannapolis, N. C. Shipped between June 7 and 10, 1940. Composition: essentially sugar, alcohol and water with extracts of plant drugs including cubeb and peppermint. Misbranded because claim on label "aids the elimination of the toxic poisonous substances" was false and misleading.—[*D. D. N. J., F. D. C. 426; September 1942.*]

Catawba's Pep-A-Man Tonic Laxative.—W. B. Goebel, trading as Botanical Medicine Company, Kannapolis, N. C. Shipped between June 7 and 10, 1940. Composition: extracts of plant drugs including a laxative drug, aloin and strychnine sulfate. Misbranded because of false and misleading representations on the label that it possessed tonic properties and the restorative, vitalizing and invigorating properties implied in the name, "Pep-A-Man."—[*D. D. N. J., F. D. C. 426; September 1942.*]

Digesto-Pep.—Smith Brothers Drug Company, Greensboro, N. C. Shipped Dec. 10, 1940. Composition: alkaline compounds, including a bismuth compound and diastase. Misbranded because its name and the terms used, such as "aids digestion" and "intended for use in correcting conditions associated with . . . sluggish digestion" were false and misleading, since the product was not a digestant of the various constituents of food, could not be depended on to produce "pep" or aid digestion and correct sluggish digestions. Further misbranded because label statements, "keep in step with Digesto-Pep" and "go smiling thru as thousands do," were false and misleading since the product could not be depended on to fulfil the implied promises.—[*D. D. N. J., F. D. C. 446; September 1942.*]

Pine-Orum Compound.—John C. Schaffer, trading as Pine-Orum Chemical Company, New Augusta, Miss. Shipped Feb. 23, 1940. Composition: a medium heavy oil with a strong pine oil odor, consisting essentially of a pine tar distillate containing sulfur or sulfur compounds and a small amount of water. Misbranded because of false and misleading statements on bottle label representing that the product was an efficacious treatment for coughs, colds, pneumonia, headache, indigestion, worms, burns, infections, blood poisoning, tonsillitis, pyorrhea, rheumatism, old chronic sores, athlete's foot, hemorrhoids and dandruff, among other things, would stop the flow of blood, and when used in the bath would have medicinal properties; further misbranded because package did not conspicuously show name and place of business of manufacturer, packer or distributor, nor did label accurately state quantity of contents or common or usual name of each active ingredient or give directions for external use, for which it was intended.—[*D. D. N. J., F. D. C. 439; September 1942.*]

Vitaphore.—Vitaphore Appliances, Inc., South Bend, Ind. Shipped April 27, 1940. Composition: an electrical device so constructed as to apply vibration and heat to the body. Falsely represented to improve the complexion, rebuild health, "rejuvenate," remedy headaches, neuritis, scars, skin diseases, varicose veins, asthma, catarrh, falling hair, pyorrhea, female disorders and a good many other things.—[*D. D. N. J., F. D. C. 393; March 1942.*]

Vitaphosphates.—Physicians Drug and Supply Company, Philadelphia. Shipped between April 16 and 30, 1940. Composition: less than 50 U. S. P. units of vitamin B_1 per fluid ounce, whereas label falsely represented a content of 400 U. S. P. units of this vitamin per fluid ounce; hence adulterated and misbranded.—[*D. D. N. J., F. D. C. 462; September 1942.*]

Young's (Dr.) Pilloment.—F. E. Young and Company, Chicago. Shipped between May 10 and June 10, 1940. Composition: essentially petrolatum (99.15 per cent), with phenol (0.73 per cent) and extracts of drugs including a mydriatic drug such as belladonna. Misbranded because falsely represented on label to promote healing of hemorrhoids and, in conjunction with "Dr. Young's Rectal Dilators" (which were declared misbranded in this same case) to be an effective treatment for rectal irritation and itching and bleeding hemorrhoids.—[*D. D. N. J., F. D. C. 335; March 1942.*]

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Feb. 13, page 539.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 15-16. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, April 6-7. Sec., Dr. J. H. Patterson, 826 Security Building, Phoenix.

ARKANSAS: * *Medical.* Little Rock, June 3-4. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, June 3-4. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: Los Angeles, March 8-11. Sec., Dr. C. B. Pinkham, 1020 N St., Sacramento.

COLORADO: * Denver, April 7-9. *Endorsement.* Denver, April 6. Final date for filing application is March 20. Sec., Dr. J. B. Davis, 831 Republic Building, Denver.

CONNECTICUT: * Hartford, March 9-10. *Endorsement.* Hartford, March 23. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, March 9-10. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 13-15. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * Washington, May 10-11. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, June 21-22. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, March 23-24. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, July 13. Director Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Building, Boise.

ILLINOIS: Chicago, April 6-8. Superintendent of Registration, Department of Registration and Education, Mr. Philip M. Harman, Springfield.

INDIANA: Indianapolis, Sept. 14-16. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

IOWA: * Iowa City, Feb. 22-24. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Kansas City, May 19-20. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, March 2-4. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

LOUISIANA: New Orleans, March 11-13. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MAINE: Portland, March 9-10. Sec., Board of Registration in Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, March 23-26. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 15-16. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, March 9-12. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MICHIGAN: * Ann Arbor and Detroit, June 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.

MINNESOTA: * Minneapolis, March 22-24. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., Minneapolis.

MISSOURI: St. Louis, March 23-25. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA: Helena, April 6-7. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEW HAMPSHIRE: Concord, March 11-12. Sec., Board of Registration in Medicine, Dr. Deering G. Smith, State House, Concord.

NEW JERSEY: Trenton, June 15-16. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 12-13. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NORTH CAROLINA: Raleigh, June 14-18. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, July 6-9. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, March 16-19. *Endorsement.* Columbus, April 6. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, May 10. Sec., Dr. J. D. Osborn, Jr., Frederick.

RHODE ISLAND: * Providence, April 1-2. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, March 22-24. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: * Pierre, July 20. Dir., Medical Licensure, State Board of Health, Dr. J. F. D. Cook, Pierre.

TENNESSEE: Memphis & Nashville, March 24-27. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

UTAH: Salt Lake City, June. Dir., Department of Registration, Mr. G. V. Billings, 324 State Capitol Bldg., Salt Lake City.

VERMONT: Burlington, March 25-27. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, March 24-27. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Charleston, March 1-3. Commissioner, Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: * Milwaukee, March 30-April 1. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, March 16. Sec., Dr. R. L. Nugent, Science Hall, University of Arizona, Tucson.

COLORADO: Denver, March 10-11. Sec., Dr. E. B. Starks, 1459 Ogden St., Denver.

DISTRICT OF COLUMBIA: Washington, April 19-20. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 E. Municipal Bldg., Washington.
FLORIDA: DeLard, June 9. Sec., Dr. J. F. Conn, John B. Stetson, University, DeLand.
IOWA: Des Moines, April 13. Dir., Division of Licensure & Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.
MINNESOTA: Minneapolis, April 6-7. Dr. J. C. McKinley, 126 Millard Hall, Univ. of Minnesota, Minneapolis.
OKLAHOMA: Oklahoma City, May. Sec., Dr. Oscar C. Newman, Shattuck.
SOUTH DAKOTA: Aberdeen, June 4-5. Sec., Dr. G. M. Evans, Yankton.
WISCONSIN: Madison, April 3. Prof. Robert N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Oklahoma Reciprocity Report

The Oklahoma State Board of Medical Examiners reports 19 physicians licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners from June 8 through Dec. 31, 1942. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School		(1942)	Kansas
State University of Iowa College of Medicine		(1905), (1914), (1925)	Iowa
University of Kansas School of Medicine		(1930)	Kansas
University of Louisville School of Medicine		(1940), (1941)	Kentucky
Tulane University of Louisiana School of Medicine		(1932)	Louisiana
Johns Hopkins University School of Medicine		(1921)	Maryland
Ohio State University College of Medicine		(1923)	Ohio
Starling Medical College		(1892)	Ohio
University of Cincinnati College of Medicine		(1936)	Ohio
Western Reserve University School of Medicine		(1934)	Ohio
Meharry Medical College		(1941)	Tennessee
Baylor University College of Medicine		(1930), (1931)	Texas
University of Texas School of Medicine		(1924), (1930)	Texas
McGill University Faculty of Medicine		(1937)	Kentucky

School	LICENSED BY ENDORSEMENT	Year Grad.
Tulane University of Louisiana School of Medicine		(1941)

District of Columbia November Report

The District of Columbia Board of Examiners in Medicine and Osteopathy reports the written examination for medical licensure held at Washington, Nov. 9-10, 1942. The examination covered 9 subjects and included 60 questions. An average of 75 per cent was required to pass. Eight candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
George Washington University School of Medicine		(1935)	1
Georgetown University School of Medicine		(1940)	1
Johns Hopkins University School of Medicine		(1929)	1
Columbia University College of Physicians and Surgeons		(1938)	1
University of Pennsylvania School of Medicine		(1941)	1
Medical College of Virginia		(1941)	1
McGill University Faculty of Medicine		(1941)	1
Osteopath *			1

* Examined in surgery only.

Vermont June Report

The Vermont State Board of Medical Examiners reports the written examination for medical licensure held at Burlington, June 16, 1942. The examination covered 12 subjects and included 90 questions. An average of 75 per cent was required to pass. Twenty candidates were examined, 19 of whom passed and 1 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
Syracuse University College of Medicine		(1942)*	1
University of Rochester School of Med. and Dentistry		(1940)	1
University of Vermont College of Medicine		(1941),* (1942, 16)*	17

School	FAILED	Year Grad.	Number Failed
Johns Hopkins University School of Medicine		(1917)	1

Ten physicians were licensed to practice medicine by endorsement from February through October 1942. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Yale University School of Medicine		(1910)	New York
State University of Iowa College of Medicine		(1929)	Iowa
Johns Hopkins University School of Medicine		(1930)	Connecticut
Harvard Medical School		(1904)	Mass.
Tufts College Medical School		(1930), (1939)	Nat. Board
Cornell University Medical College		(1923)	Nat. Board
Woman's Medical College of Pennsylvania		(1941)	Penna.
University of Vermont College of Medicine		(1941)	Nat. Board
University of Edinburgh Faculty of Medicine		(1900)	N. Carolina

* Licenses have not been issued.

Miscellany

MEDICAL STANDARDS FOR PHYSICIANS IN THE SCHOOLS PROPOSED BY THE AMERICAN ACADEMY OF PEDIATRICS

In 1937 the Committee on School Health of the American Academy of Pediatrics proposed five principles to guide in the development of medical services for public schools. Last year the committee reemphasized the second principle, which was concerned with medical standards and the maintenance of quality of service. We quoted from one of the principles of the American Medical Association: "The responsibility for the character of medical service must be borne by the medical profession" and declared "The advice which is given to parents, pupils or school staff should meet the best medical standards."

While the soundness of these principles has not been questioned, a neglect of medical standards has been almost characteristic of school service until very recently, and still too many places allow the responsibility for the character of medical service to be borne by lay administrators. Organization plans generally provide no way of being sure that the school administrator's decisions will be made with the benefit of a full understanding of medical problems.

If the schools are to make a more effective use of their strategic position to educate parents and children to use curative and preventive medical services intelligently, then the great professions of education and medicine must work together in a common cause. Some plan of administration is necessary for educational matters to be guided by educators and for medical policies to be determined by physicians. There must be a plan that avoids decisions made on administrative convenience only rather than on professional principles.

ORGANIZATION PLANS

As the physician in the schools may receive his direction from the health department, the education department or a combination of the two departments, we should consider how each type of organization may be planned to conform to our medical principles:

1. The administrator of a school health service under a health department should provide for a medical administrator to give direction and leadership in interpreting medical standards. With civil service or other plans for a merit system the qualifications of personnel must be decided according to a sound interpretation of needs. Either through the board of health or through a special medical advisory committee the executive should have the support and advice of real medical leadership. From the education department he should also have such an organization plan as will provide at all times for ready consultation and leadership of the educational staff.

2. If the administration is under the education department, there is often a problem of obtaining a medical executive for the smaller school systems unless a full time medical executive can be arranged to serve several school districts, or for the medium sized school systems unless the executive can be combined with the medical staff part of the service on a full time basis. In either case a medical advisory board is needed to safeguard professional qualifications and conditions of employment for the medical staff. A board for determining essential broad policies is an accepted and well tried plan to safeguard the public welfare by providing advice, support and control of the executive.

3. When the school health service is administered under joint control of the health and education departments, the need for a medical executive can usually be supplied through the health department's contribution, or by a special medical administrator responsible to a joint board. The joint board from both departments should direct or advise the medical staff. Sound public service demands that the public always have the benefit of the recognized channels of organized medicine for determining medical standards. If these standards are to be applied for the selection of medical personnel and for determining the conditions of employment for physicians, then an organization plan must provide the means for interpreting how the standards may best meet the needs of an individual situation.

PROFESSIONAL QUALIFICATIONS

There is, therefore, need for two kinds of professional standards for medical personnel:

1. For medical administrator.
2. For staff physician.

The medical administrator should meet, in addition to basic pediatric training, standards of training and experience in public health administration and education, and the staff physician should meet qualifications in clinical and preventive pediatrics.

While full time medical personnel is recommended for administrative positions, the requirement of full time for staff positions is likely to discriminate against the more competent, ambitious and well qualified clinicians, because the more competent physicians are not likely to be willing to give up the rewards available to them through private practice. Until the pay for staff positions can be made very much more inviting, the most competent physicians will be available for staff positions only on a part time basis.

As far as qualified physicians are available, preference should be given to those physicians who meet the following qualifications in the order named:

1. Specialist certified by the American Board of Pediatrics.
2. Fellow of the American Academy of Pediatrics or qualifications meeting academy requirements.
3. Alumnus of hospital registered by the American Medical Association and with residency fellowship in pediatrics.
4. Alumnus of hospital registered by the American Medical Association which included service of one year in pediatrics where there is an approved residency or fellowship in pediatrics. (Communicable diseases included in pediatrics.)
5. Alumnus of hospital registered by the American Medical Association (one and one-half year internship and an appointment in pediatrics to a registered hospital, including outpatient department or hospital appointment).
6. Part time specialty in pediatrics with pediatric appointment in registered hospital.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Indispensability of Record of Board as Evidence in Appeal Proceeding from Revocation Order.—The petitioner's license as a drugless practitioner was revoked with the proviso that if he would sign a stipulation to refrain from the use of all advertising except the use of the words "drugless practitioner" on his professional card his license would be restored and he would be placed on five years' probation. The petitioner sought a writ of mandamus to compel the respondent board of medical examiners to restore his license. The trial judge suggested that a transcript of the proceedings had before the board should be introduced in evidence by the petitioner, but the petitioner refused to produce the transcript on the ground that he was entitled to a trial de novo without reference to the evidence produced before the board. The trial judge held that the introduction of such transcript was a jurisdictional prerequisite, that in its absence no other evidence could be presented, and denied the petition for mandamus. From this ruling the petitioner appealed to the district court of appeal, first district, division 1, California.

The petitioner contended that when a practitioner has had his license revoked by an administrative board exercising statewide functions and seeks by mandamus to have such license restored he is entitled to a trial de novo in the literal sense and that the evidence introduced before the administrative board is incompetent for any purpose. The board contended, on the other hand, that on the trial of the mandate proceedings the record of the board's proceedings must be introduced as a condition precedent to the further exercise of jurisdiction and that the only additional evidence authorized is subsequently discovered evidence or evidence improperly excluded by the board.

In the opinion of the appellate court, neither contention was entirely sound. A petitioner in a mandamus proceeding of this kind is entitled to a trial de novo in which the trial court must exercise an independent judgment on the facts; the petitioner is not limited to the record made before the board but may introduce additional evidence. But the board's record is legal, competent evidence so as to be admissible over the objections of one of the litigants. Such record, however, is not indispensable evidence so as to justify the trial court in refusing to proceed unless the petitioner produces it. If the record is produced by either it must be admitted, but if neither produces it a trial court has no power to compel its production or to refuse to proceed unless introduced.

The petitioner next contended that, even though no evidence was introduced, the allegations of the petition for mandate and the answer and return thereto demonstrate, as a matter of law, that no offense warranting discipline was committed by him. The complaint filed before the board charged that the petitioner (1) used the prefix "Dr." in a window sign in connection with his name without otherwise indicating the type of certificate possessed by him and that the petitioner did not hold a physician's and surgeon's certificate, and (2) that he used the letters "N.D." as a suffix to his name in a window sign, which indicated that he was entitled to practice naturopathy but that at the time he was not licensed to practice naturopathy. A section of the Business and Professions Code provides: "Unless a person licensed and authorized under this chapter or any preceding medical practice act to use the title 'doctor' or the letters or prefix 'Dr.,' hold a physician's and surgeon's certificate, the use of this title or these letters or prefix without further indicating the type of certificate he holds, constitutes unprofessional conduct within the meaning of this chapter." The constitutionality of statutes requiring all practitioners except physicians and surgeons to indicate the type of certificate held in connection with the use of the title "Doctor" or "Dr." is not open to question, said the court. There is a reasonable ground for such distinction. In common parlance the term "doctor" is customarily used to refer to physicians and surgeons. The legislature was justified in believing that the use of such title by others without descriptive designation would tend to indicate to the public that the user is a physician or surgeon. The court therefore ruled against the petitioner's contention that this provision in the California law was unconstitutional class legislation.

With respect to the charge that the petitioner used the letters "N.D." as a suffix to his name in a window sign, it was admitted that his license as a drugless practitioner authorized him "to treat diseases, injuries, deformities, or other physical or mental conditions without the use of drugs or what are known as medical preparations and without in any manner severing or penetrating any of the tissues of human beings except the severing of the umbilical cord." It was clear to the court that naturopathy is a form of drugless practice within the statutory definition quoted. If the petitioner possessed the degree of doctor of naturopathy, as he alleged, there was no violation of the Business and Professions Code in the use of the letters "N.D." Whether or not he possessed the degree, however, was a question of fact to be determined by the trial court.

Because the trial court erroneously refused to proceed unless the board's record was produced by the petitioner and because of the existence of certain factual situations which required a determination by the trial court, the judgment in favor of the board was reversed.—*Dare v. Board of Medical Examiners of State of California, 127 P. (2d) 977 (Calif., 1942).*

Society Proceedings

COMING MEETINGS

American Orthopsychiatric Association, New York, Feb. 22-24. Dr. Norvelle C. LaMar, 149 East 73d St., New York, Secretary.

Conference of State and Provincial Health Authorities of North America, Washington, D. C., March 22-25. Dr. A. J. Chesley, 469 State Office Bldg., St. Paul, Secretary.

Ohio State Medical Association, Columbus, March 30-31. Mr. Charles S. Nelson, 79 East State St., Columbus, Executive Secretary.

Florida Medical Association, Jacksonville, April 15-16. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

12: 161-192 (Dec.) 1942

Safety in Intestinal Surgery. T. B. Hubbard, Montgomery.—p. 161.
Urinary Concretions: I. Observations on Laboratory Examinations of Urinary Stones. L. C. Posey, Birmingham.—p. 163.
Clinical Evaluation of Erythrocyte Sedimentation Rate. R. McBurney, Tuscaloosa.—p. 166.
Rapid Treatment of Early Syphilis with Multiple Injections of Mapharsen: Five Day Treatment. C. W. Shropshire, Birmingham. —p. 170.
Some Recent Advances in Diagnosis and Treatment of Tuberculosis. E. J. Teagarden, Decatur.—p. 173.
Previously Undescribed Allergic Keratitis: Report of Cases. N. E. Miles, Birmingham.—p. 176.

American J. Digestive Diseases, Fort Wayne, Ind.

9:399-434 (Dec.) 1942

Varices of Gallbladder; Associated with Mucosal Cyst: Report of Case. M. Feldman, J. E. Goodman and T. Weinberg, Baltimore.—p. 399.
*Critical Analysis of 938 Gastroscopic Examinations. R. J. F. Renshaw, G. E. Clark Jr. and J. R. Forsythe, Cleveland.—p. 401.
Gastric Atrophy in Far Advanced Pulmonary Tuberculosis Complicated by Intestinal Tuberculosis. L. L. Hardt, M. Weissman and J. S. Coulter, Chicago.—p. 404.
Gastric Mucosal Changes of Tuberculosis. D. C. Browne, G. McHardy and C. Wilen, New Orleans.—p. 407.
Histopathology of Chronic Gastritis. R. Schindler and Marie Ortmayer, Chicago.—p. 411.
Secretion of Water as Component of Gastric Acid Secretion. H. W. Davenport, Philadelphia.—p. 416.
Parotid Duct Obstruction Without Calculus: Suggestion for Treatment. L. Pelner, Brooklyn.—p. 417.
Prothrombin and Fibrinogen Studies in Chronic Ulcerative Colitis. R. C. Page and Z. Bercovitz, New York.—p. 419.
Studies on Colon Irritation: III. Bulk of Feces. O. Wozasek and F. Steigmann, Chicago.—p. 423.
Serum Diastase Determinations During Artificially Produced Intraduodenal Pressure Against Head of Pancreas: Preliminary Report. S. G. Castigliano, Philadelphia.—p. 425.
Pancreatitis in Acute and Chronic Alcoholism. E. Clark, New York. —p. 428.

Analysis of Gastroscopies.—Analysis of 938 consecutive unselected gastroscopies of 842 patients by Renshaw and his associates demonstrated that in 217 the method was of major value in establishing the diagnosis when all other examinations were negative or indeterminate. Gastroscopy was of minor additional value in 566 cases in that it did not alter the major diagnosis, treatment and prognosis. For the most part the minor contribution was confirmatory for roentgen study. In the remaining cases its major limitation was that in some the roentgenologist reported either a definite or suspected lesion but the area in question could not be seen by the gastroscopist. In a few not only could the area in question not be seen but also other large areas or the major part of the stomach could not be satisfactorily visualized. In others the examination could not be completed because of spasm of the esophagus, acute angulation of the esophagus or angulation of the instrument beyond its useful range. The amount of distress suffered by the patient was but a minor limitation compared to the amount of distress of the average patient after an Ewald test meal. For comparing these two dissimilar complementary or supplementary but not competitive methods 170 cases were selected that had been followed long enough to establish the diagnosis at operation or at necropsy. Only the first gastroscopy and roentgenoscopy made at comparable times were considered. Both methods agreed in 109 of the 170 cases, both were wrong in 9 and both were indeterminate in 14. Roentgenoscopy was correct and gastroscopy indeterminate in 15, while gastroscopy was correct and roentgenoscopy indeterminate in 23. The fact that one method may be indeterminate while the other may establish the diagnosis further emphasizes the fact that the methods are complementary and that often both methods are required for a complete and comprehensive diagnostic investigation.

American Journal of Diseases of Children, Chicago

64:963-1158 (Dec.) 1942

*Prolonged Use of Sulfonamide Compound in Prevention of Rheumatic Recrudescences in Children: Evaluation Based on Four Year Study on Sixty-Four Children. Arild E. Hansen, R. V. Platou and P. F. Dwan, Minneapolis.—p. 963.
Coconut Water: Clinical and Experimental Study. E. S. Pradera, E. Fernandez and O. Calderin, Havana, Cuba.—p. 977.
Creatinuria in Infancy and in Childhood: II. Creatinuria of Premature Infants. Eleanor Marples, New York.—p. 996.
Attempts to Produce Absorption of Poliomyelitis Virus by Peripheral Nerves in Vitro. J. A. Toomey, Linda A. Tischer and W. S. Takacs, Cleveland.—p. 1008.
Possibility of Artificial Sensitization to Tuberculin. M. I. Levine and Margaret F. Sackett, New York.—p. 1014.
Early Infantile "Diffuse Sclerosis" of Brain (Krabbe's Type): Report of Two Cases, with Review of Literature. G. A. Jervis, Thiells, N. Y.—p. 1055.
Coarctation of Aorta in Childhood: Review of Literature and Report of Three Cases. P. H. Rhodes and E. Durbin, Denver.—p. 1073.

Rheumatic Recrudescences.—Of the 64 children given sulfanilamide (or sulfathiazole or sulfadiazine in a few cases) for four seasons from October into June for the prevention of a recurrence of rheumatic fever, only 2 received the drug for all four seasons, 5 for three seasons, 9 for two seasons and 37 for one season. Hansen, Platou and Dwan found the age, sex, socioeconomic status, number of attacks of rheumatic fever and degree of cardiac involvement comparable in 32 control subjects. All the children studied were between 3 and 16 years of age. Only 2 of the 53 treated with sulfanilamide experienced a rheumatic flare-up, and in 1 this occurred within six days of starting chemotherapy. On the other hand, 17 of the 32 control children had a total of twenty-one rheumatic recrudescences. In 8 these recurrences were moderately severe, in 7 mild and in 6 they were choreic. In addition, the trend in degree of cardiac involvement, size of the heart and functional classification were more favorable in the treated children. There appeared to be no difference in the number of infections of the upper respiratory tract in the two groups. The treated patients gained as well as the control patients and from a clinical point of view tended to be in better condition. Improvement, though suggestive, in the electrocardiographic tracings of several patients could not be attributed to the effects of the drug alone. Although the series is small, the results of chemotherapy were consistent and when interpreted in the light of the results of other investigators they appear to justify further similar study, especially when the disease is one of the major causes of disability and death in children of school age in the temperate zone. Every child so treated should be under the constant care of a physician.

American Journal of Physiology, Baltimore

138:1-190 (Dec.) 1942. **Partial Index**

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Relation Between Pulmonary Ventilation and Oxygen Consumption After Exercise. J. M. Barman, F. Consolazio and M. F. Moreira, Boston. —p. 16.
Metabolic Effects of Local Ischemia During Muscular Exercise. J. M. Barman, M. F. Moreira and F. Consolazio, Boston.—p. 20.
Influence of Rickets and of Healing of Rickets on Mechanical Properties of Tibias of Rats. A. A. Schiller, H. C. Struck and C. I. Reed, Chicago.—p. 27.
Effect of Meat and Meat Fractions on Fatty Liver of Depancreatized and Pancreatic Duct Ligated Dog. Elaine P. Ralli and S. H. Rubin, New York.—p. 42.
Cardiovascular Effects of Experimental Insomnia. F. Henry, Berkeley, Calif.—p. 65.
Creatinuria in Man Following Oral Administration of Caffeine. G. Bachmann, J. Haldi, C. Ensor and W. Wynn, Atlanta, Ga.—p. 78.
Motor Innervation of Colon. J. A. Wells, T. H. Mercer, J. S. Gray and A. C. Ivy, Chicago.—p. 83.
Metabolism of Asphyxiated Spinal Cord. A. van Harreveld and D. B. Tyler, Pasadena, Calif.—p. 140.
Experimental Study of Tourniquet as Method for Inducing Circulatory Failure in Dog. W. W. Swingle, J. W. Remington, W. Kleinberg, V. A. Drill and W. J. Eversole, Princeton, N. J.—p. 156.

American Review of Tuberculosis, New York

46:587-716 (Dec.) 1942

Studies of Mycobacteria with Electron Microscope. M. B. Rosenblatt, E. F. Fullam and A. E. Gessler, New York.—p. 587.
Enzymes as Factors in Resistance to Tuberculosis. B. Gerstl and R. Tennant, New Haven, Conn.—p. 600.
Experimental Pulmonary Tuberculosis in Dog. F. D. Gunn, J. J. Sheehy, Charlotte A. Colwell and M. A. Mills, Chicago.—p. 612.
Gastric Lavage in Healthy Adolescents: Bacteriologic Study of Fasting Gastric Contents for Tubercle Bacilli. C. Floyd, H. A. Novack and C. G. Page, Boston.—p. 622.
Atypical Findings on Animal Inoculation. S. E. Franco and J. Gurevitch, Jerusalem, Palestine.—p. 625.
*Pneumothorax Treatment: Subsequent History of Tuberculous Patients After Their Selection for Pneumothorax. W. H. Morriss, Wallingford, Conn.—p. 628.
*Ambulatory Pneumothorax: Results of Ten Years' Experience. F. Tice, Chicago.—p. 639.
*Extrapleural Pneumothorax: Late Results. P. Geary, Plainfield, N. J.—p. 646.
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Tuberculosis in England During War. J. B. McDougall, Maidstone, England.—p. 677.
Arytenoid Extrusion with Roentgenologic Studies. W. C. Voorsanger, San Francisco.—p. 684.
Browning's Meteoropathologic Observations in Tuberculosis. W. F. Petersen, Chicago.—p. 690.

Pneumothorax Treatment.—Between 1921 and 1939, 770 patients were selected for pneumothorax treatment. The treatment of 157 was rated as unsuccessful and discontinued in less than three months; 243 were not adequately traced, as they left the sanatorium for various reasons and had their pneumothorax carried on elsewhere. Treatment of the remaining 370 was carried on at the sanatorium and after discharge at the ex-patient clinic for an average of five and a half years after pneumothorax was discontinued. Of these 370 patients, Morriss states, 245 are able to work full time, 23 part time, 27 are still being treated and 75 have died since collapse was instituted. The ineffectiveness of collapse, a moderate contralateral lesion at the onset, a massive effusion and empyema, a severe contralateral spread of the lesion during collapse and the necessity of discontinuing pneumothorax in less than two years influenced the end result unfavorably. At the time of reexpansion the cavity of 96.3 per cent was closed and the sputum of 89.6 per cent was negative. The anatomic end results in the reexpanded lung were excellent in 23.5, very good in 16.2, fair in 32, poor in 25.3 and nonexpandable in 2.9 per cent. Relapse in either the collapsed or the contralateral lung occurred in 35; of these patients less than one third died. The most unfavorable complication of pneumothorax was the development of a large effusion; this occurred in 29 per cent of the patients and appreciably increased the chances of an unfavorable outcome. In one fourth of these patients with large effusions empyema developed, and almost one half of the latter patients died. The total mortality from empyema was 3.5 per cent and the incidence 7.1 per cent. Pneumothorax in spite of its hazards is still a valuable method of treating properly selected patients, especially those whose disease is rapidly progressing in spite of bed rest.

Ambulatory Pneumothorax.—Tice discusses results of pneumothorax in 4,810 of 6,481 tuberculous patients (treated during the ten years preceding July 1941) who had ambulant care; in 2,586 it was combined with sanatorium care. The disease of only 5 per cent was in the minimal stage and of the rest it was moderately or far advanced; the sputum of 73 per cent was positive when treatment was started, and cavitation was present in 60 per cent. At the time of the report 60 per cent were living, 25 per cent were dead and 15 per cent could not be traced. Excluding the patients who died, 21 per cent gained 5 to 10 pounds (2.3 to 4.5 Kg.), 20 per cent 10 to 20 pounds (4.5 to 9 Kg.) and 15 per cent gained 20 or more pounds. The weight of 32 per cent remained stationary and that of 12 per cent decreased. Excluding nonemployables, such as housewives, students and children, 41 per cent of the patients given ambulatory pneumothorax were employed at the time of the report. Another 13 per cent were physically employable but, apparently, unable or unwilling to find work. It may be well to consider the possibility of ambulant pneumothorax as a rehabilitative measure. Of the 2,224 treated exclusively in the clinics, 53 per cent were living at the time of the report as against 56 per cent of those receiving sanatorium treatment exclusively. Of the patients receiving both institution and clinic treatment 73 per cent were living at the time of the report. The disease of 31 per cent of the 2,800 patients with reexpanded lungs is classified as arrested, of 20 per cent as apparently arrested, of 7 per cent as quiescent, of 21 per cent as improved and of 21 per cent as unimproved. Of the 2,000 patients still under collapse treatment, 90 per cent are classed as improved and 10 per cent as unimproved. The influence of the initial diagnosis on the end results is shown by the following figures: Of 5,500 known cases, 96 per cent with minimal disease were living as against 81 per cent of those with moderately and 63 per cent of those with far advanced disease. These results clearly indicate the value of collapse therapy in early tuberculosis. Considering pneumothorax with or without ancillary measures, thoracoplasty combined with other procedures gave the best results, 74 per cent living against 60 per cent living for pneumothorax alone, 56 per cent for pneumothorax and the phrenic operation combined and 45 per cent for phrenectomy alone. The results balanced against the time elapsing since treatment were considered satisfactory.

Extrapleural Pneumothorax.—During 1938 and 1939, 75 patients were subjected to extrapleural pneumothorax. Geary's report deals with the results after an average postoperative period of slightly more than forty months. The early results were reasonably good, but as the postoperative period increased so did the complications. The most serious was infection of the established extrapleural pneumothorax space, which often developed late. It was present in 37.3 per cent of the patients. The operation is as dangerous as thoracoplasty, while the obliteration of an unsatisfactory extrapleural pneumothorax space by thoracoplasty is more dangerous at times than a thoracoplasty as a first operation. The space was abandoned in 2 cases because the pneumothorax was no longer thought necessary. There is little tendency toward reexpansion of a lung that has been collapsed by prolonged extrapleural pneumothorax. Routine conversion of the pneumothorax spaces into oleothorax has not been adopted. Because of the operative risk, the frequency of complication and uncertain end results, extrapleural pneumothorax is unsatisfactory.

Annals of Internal Medicine, Lancaster, Pa.

17:891-1064 (Dec.) 1942

Modern Views on Treatment and Prevention of Hookworm Disease. J. Andrews, Atlanta, Ga.—p. 891.
Myeloid Hyperplasia and Metaplasia Induced by Extracts of Urine from Patients with Myelogenous Leukemia. R. W. Heinle, J. T. Wearn, D. R. Weir and F. A. Rose, Cleveland.—p. 902.
*Sulfadiazine: Further Clinical Studies of Its Efficacy and Toxic Effects in 460 Patients. M. Finland, O. L. Peterson and R. A. Goodwin Jr., Boston.—p. 920.
Control of Hyperglycemia of Obese "Diabetics" by Weight Reduction. L. H. Newburgh, Ann Arbor, Mich.—p. 935.
*Clinical Significance and Treatment of Pyuria. W. F. Braasch, Rochester, Minn.—p. 943.
High Fluid Intake in Management of Edema, Especially Cardiac Edema: I. Details and Basis of Regimen. F. R. Schemm, Great Falls, Mont.—p. 952.
*Orientation of Treatment in Thrombophlebitis, Phlebothrombosis and Pulmonary Embolism. J. A. Evans, Boston.—p. 970.
*Intracutaneous Inoculation of Poliomyelitis Virus in Monkeys and Its Detection in Their Stools. J. D. Trask and J. R. Paul, New Haven, Conn.—p. 975.
The Army's New Frontiers in Tropical Medicine. J. S. Simmons, Washington, D. C.—p. 979.
Consideration of Factor of Change in Animal Organism. W. deB. MacNider, Chapel Hill, N. C.—p. 989.

Sulfadiazine.—Finland and his associates used sulfadiazine at the Boston City Hospital in 460 cases of streptococcic, staphylococcic and gonococcic infections, the bacterial meningitides and infections of the urinary tract. Usually sulfadiazine was used only if other sulfonamides had not already been given, and treatment was continued when toxic effects resulted from other sulfonamides and further chemotherapy was necessary. Sulfadiazine may be accepted as the drug of choice in hemolytic streptococcus infection and in the various acute bacterial meningitides. In acute gonococcic and staphylococcic infections and in the acute infections of the urinary tract the efficacy of sulfadiazine in most cases is probably similar to that of sulfathiazole,

but because of its lower toxicity sulfadiazine is probably the drug of choice, particularly when therapy is to be prolonged. The authors' results and those of others seem to justify the claim that sulfadiazine is the drug of choice for initiating chemotherapy in acute pulmonary infections and for continuing treatment when the causative organism is the pneumococcus, the streptococcus and probably also the staphylococcus and Friedländer's bacillus. Toxic effects attributable to sulfadiazine are relatively few and mild. The comparatively frequent complications of the urinary tract warrant the control of its dose in relation to fluid intake and output, particularly for old persons, patients with hypertension and every patient with a probable impairment of renal function. The occurrence of agranulocytosis in 1 patient after prolonged therapy suggests that, despite the infrequency of this complication, it must be looked for in all patients treated with sulfadiazine for two weeks or more. Early recognition and prompt withdrawal of the drug will probably avert death. "Sensitization" was not observed in any of the 21 patients who received a second or third course of sulfadiazine. However, its possibility has not been excluded. Episcleritis was reactivated on early readministration of sulfadiazine to 1 patient. Other rashes and febrile reactions, known to occur when the drug is given after a brief interval, have not appeared.

Clinical Significance and Treatment of Pyuria.—The following data are given by Braasch in his summary of the clinical significance and treatment of pyuria: Pus cells in the voided urine of a female patient have little or no clinical significance. In such instances a catheter specimen of urine is necessary. Pus cells in the voided urine of the male patient are of greater clinical value, particularly if they are in evidence after the two glass test. It is of equal importance to determine the type of bacteria present in the urine. Intelligent treatment of pyuria is dependent on a knowledge of its bacteriologic aspects. Bacillary infection from colon bacilli or Aerobacter aerogenes is usually found. If mixed infection is present, it is most often caused by colon bacilli with Streptococcus fecalis. Unless this fact is recognized, chemotherapy may fail. Renal tuberculosis which resists chemotherapy is a frequent cause of pyuria. Recently the symptoms and severity of this infection have become milder and its recognition often is difficult. Pyuria may be coincident with lesions in other organs, such as acute cholecystitis. Urinary infection as a rule does not interfere with operation, but a search should be made for the cause of the pyuria. A careful search for foci of infection and their removal are always necessary. Pyuria or a history of previous urinary infection occurring with hypertension demands a complete urologic investigation. In the presence of pyuria important clinical data can be obtained by such simple tests as the making of roentgenograms and excretory urograms. Intelligent chemotherapy depends on identification of bacteria. Persistent pyuria, in spite of indicated chemotherapy, usually is caused by some underlying pathologic lesion in the urinary tract which requires careful treatment.

Thrombophlebitis, Phlebothrombosis and Pulmonary Embolism.—As deep phlebothrombosis of the femoral or calf venous plexuses is a source of pulmonary embolism, Evans suggests that, if the patient is more than 50, section of the femoral vein should be seriously considered. If such patients have already suffered a warning embolism, ligation and section of the femoral vein or of the external iliac vein is indicated. Phlebothrombosis in the pelvic veins is a dangerous source of pulmonary embolism. Prolonging the clotting time by heparin or dicumarol or both prevents propagation of a clot in the pulmonary artery should embolism occur. In phlegmasia alba dolens, early lumbar sympathetic procaine block is best, although surprisingly good results have been obtained in chronic cases. There is relatively little danger of pulmonary embolism in typical "milk leg." Thrombophlebitis migrans, thrombophlebitis of the upper extremities and the thrombophlebitis of Buerger's disease rarely cause pulmonary embolism. However, propagation of the clot into the deep veins of the leg must be watched for in phlebitis migrans. Isolation of an involved segment of vein by ligation may be necessary. Compression bandages, rest (off the feet but not in bed) and sulfathiazole are of value. Heparin or dicumarol may be needed to stay the progress of the clot in thrombophlebitis in the upper extremities.

Intracutaneous Inoculation of Poliomyelitis Virus.—Trask and Paul collected stools from 9 monkeys and 1 chimpanzee previously inoculated intracutaneously with poliomyelitis virus. The animals were placed in cages according to the four or five species and were observed for signs of experimental poliomyelitis. Stools were collected daily from each cage and weekly pools were tested for the virus. Fourteen of the postinoculation tests were negative and three were positive. The virus was detected in the first postinoculation week in the pooled stools of 2 green monkeys and in the chimpanzee's stools collected during the first and second postinoculation weeks. The most severe poliomyelitic infection occurred among the cynomolgus and mordax monkeys. Green monkeys had typical mild paralytic poliomyelitis. The mildest infection appeared in the chimpanzee. The authors believe that their detection of the virus of poliomyelitis in feces is the first study of its kind to be reported.

Archives of Internal Medicine, Chicago

70:919-1106 (Dec.) 1942

Polycythemia Vera: Report of Case. R. Fitz, B. S. Walker and C. F. Branch, Boston.—p. 919.
Clearance of Diodrast, Phenolsulfonphthalein and Inulin in Hypertension and in Nephritis. T. Findley, J. C. Edwards, Etta Clinton and H. L. White, St. Louis.—p. 935.
*Critical Statistical Analysis of Data on Renal Function in Grouped Subjects with Essential Hypertension. J. W. Dalton and F. R. Nuzum, Santa Barbara, Calif.—p. 948.
Effect of Ulcer on Acidity and Neutralizing Ability in Duodenal Bulb. J. E. Berk, M. E. Rehfuss and J. E. Thomas, Philadelphia.—p. 959.
Mercurial and Xanthine Diuretics in Chronic Congestive Heart Failure: Comparative Survey. J. I. Goodman, J. F. Corsaro and R. Stacy, Cleveland.—p. 975.
*Hyperactive Vasodepressor Carotid Sinus Reflex. L. H. Sigler, Brooklyn.—p. 983.
*Roentgen Ray Treatment of Hyperthyroidism. M. H. Soley and R. S. Stone, San Francisco.—p. 1002.
Review of Neuropsychiatry for 1942. S. Cobb, Boston.—p. 1017.
Obesity. L. H. Newburgh, Ann Arbor, Mich.—p. 1033.

Renal Function and Hypertension.—Dalton and Nuzum demonstrate that in spite of apparently small differences from normal a significant reduction exists in the ability of the kidneys of patients with essential hypertension to concentrate urine and to excrete phenolsulfonphthalein. This reduction is demonstrated only when the data on hypertensive and on normal persons are considered collectively for the respective groups instead of as individual comparisons. The age of the normal or hypertensive person or the duration of the disease has no effect on the renal function. An increase in the severity of the disease, indicated by a rise in diastolic pressure, is accompanied by a reduction of renal function. Alkaline diets apparently delay the excretion of fluids.

Vasodepressor Carotid Sinus Reflex.—Sigler studied the vasodepressor effect of the carotid sinus reflex of 700 ambulatory patients and he determined the frequency and the severity of this reflex in the two sexes, at various ages and at various levels of blood pressure. Most of them presented evidence of cardiovascular disease, but many were free from such disease. The patients were divided into four groups: those with a blood pressure of less than 150 systolic and 90 diastolic, and those with a systolic pressure from 151 to 175, 176 to 200 and more than 200 with a respective diastolic pressure from 91 to 105, 105 to 125 and more than 125. Roughly, 88 per cent of the 447 male patients and 82 per cent of the 253 female patients showed a drop in pressure. If a drop of less than 10 mm. is considered of insufficient significance, the response is reduced to about 78 per cent for the male and 71 per cent for the female patients. The response occurred more frequently and was more pronounced in older persons. Also the higher the blood pressure, the more frequent and decided was the response. A drop was more frequent in the systolic than in the diastolic pressure. A drop in pressure often occurred in patients without cardioinhibition but was more frequent in those who also showed cardioinhibition. The frequency and the degree of vasodepression were roughly the same in those with and those without cardioinhibition. In many there was a definite difference in the response to stimulation on the two sides. The amount of stimulation required to produce the maximal response varied from person to person and with the position of the patient. The data point to an inherent instability in the vasomotor system in persons who

show a decided vasodepression induced by the carotid sinus reflex. The seat of this instability is either in the medullary synapses or in the vasomotor terminals of the vascular tree. Arteriosclerosis is possibly one of its underlying predisposing causes, especially as the reflex is most prevalent under circumstances in which arteriosclerosis is apt to occur, that is, in a man of advanced age with pronounced hypertension.

Hyperthyroidism.—To determine whether or not subtotal destruction of the thyroid could be achieved with roentgen therapy and what dosage would be required, Soley and Stone irradiated the thyroid area of 43 hyperthyroid patients. Routinely the patients received 150 roentgens to each lobe of the thyroid every day for six days; thus 900 roentgens was administered to each lobe. During the same period the patients received 150 roentgens every second day to the thymus region. The study was begun in 1935 and ended in September 1940. Of the 43 patients 31 had toxic diffuse goiter and 12 toxic nodular goiter; of the latter, 7 had had an operation, 2 had what might be called nodular involution and 3 had toxic nodular goiter not previously treated. Thirty patients of the series had not been treated surgically and 13 had recurrences after operation. The average fall in the basal metabolic rate was 35.7 per cent for the 37 patients who were either "cured" or improved. Twenty-five patients may be called "cured," that is, they were free from signs or symptoms of hyperthyroidism (with the exception of residual exophthalmos), 8 were definitely improved and would probably have been called "cured" by many workers, 3 were inadequately followed and 1 was treated in preparation for operation. If this last patient, the 2 who were treated in the hope of relieving their hyperthyroidism before they died of congestive heart failure and the 3 who were inadequately followed are eliminated, the results show that of the remaining 37 patients 25 were "cured," 8 were decidedly improved and 4 not improved. Twenty-two of the patients received iodine and 21 did not in conjunction with the roentgen therapy. The "cure" or improvement occurred in an average time of eight and seven-tenths months from the onset of treatment. Complications consisted of tracheitis and esophagitis in 15 patients. To avoid these complications, radiation is now given through one port anteriorly.

Archives of Otolaryngology, Chicago

36:773-978 (Dec.) 1942

*Tracheotomy in Cases of Acute Obstructive Nondiphtheritic Infections of Larynx, Trachea and Bronchi: General Study, with Analysis of 126 Consecutive Cases Occurring During the Past Decade. A. H. Neffson, New York.—p. 773.
Embryologic Observations Bearing on Problem of Otosclerosis. T. H. Bast, Madison, Wis.—p. 816.
Association of Nerve Deafness and Retinitis Pigmentosa. F. H. McGovern, Danville, Va.—p. 827.
Reaction of Mucous Membranes to Five per Cent Solution of Sodium Sulfathiazole. L. G. Hunnicutt, Pasadena, Calif.—p. 837.
Microscopic Examination of Human Labyrinths from Patients Exposed to Loud Noises. Dorothy Wolff, St. Louis.—p. 843.
Influence of Vitamin C on Antihistamine Action of Various Drugs: Effect of Bronchiolar Reactions to Ephedrine, Epinephrine, Benzedrine and Calcium, as Studied by Microscopic Observation. S. L. Ruskin, New York.—p. 853.
Simple Method of Measuring Percentage of Capacity for Hearing Speech: Fundamental Factors in Setting Up Standard. E. P. Fowler, New York.—p. 874.
Stapes, Fissula Ante Fenestram and Associated Structures in Man: III. From Embryos 6.7 to 50 Mm. in Length. E. W. Cauldwell and B. J. Anson, Chicago.—p. 891.
Relation of Eustachian Tube to Chronic Progressive Deafness. R. M. Decker, Pasadena, Calif.—p. 926.

Tracheotomy in Laryngotracheobronchitis.—During the period from 1931 to 1940, 1,360 cases of nondiphtheritic infectious obstruction of the larynx, trachea and bronchi were observed in the Willard Parker Hospital. Intubation, in addition to aspiration, was required to relieve the obstruction in 121 and tracheotomy in 126, while 1,113 were treated by nonsurgical measures. Neffson points out that during the first seven years the incidence of tracheotomy increased from 5.3 per cent to 19.4 per cent in the last three years. During this time the incidence of intubation scarcely varied—8.7 to 9.4 per cent—but the mortality rate dropped from 43 to 28 per cent respectively during the seven and three years. From the various arguments of otolaryngologists, pediatricians, statistics and discussions, Neffson believes that if specially trained residents are available intubation in properly selected cases is the method of choice. If the patient is given an opportunity to fight the acute infection before he is compelled to cope with the added burden of an operative procedure and an alien respiratory physiology, his chances of recovery are increased. When ideal conditions for intubation do not exist, tracheotomy is to be preferred. A high incidence of Staphylococcus aureus infection has been observed during the last three years. It is probable that this organism is a secondary invader in a primary virus infection. The use of sulfathiazole or sulfadiazine is recommended if chemotherapy is resorted to before the infecting organism has been identified. Intubation is not the single important factor in prolonged cannulation. It is due also to the dense infiltration of the subglottic tissues, the formation of occasional strictures and webs which do not necessarily result from the intubation, the occurrence of prevertebral edema with compression of the trachea and tracheal stenosis around the wound. Of 153 patients who survived intubation, tracheotomy or both, 51 were seen from one to ten years later and the 21 who had been intubated showed no vocal alterations as to quality, pitch and intensity. Likewise there was no change in the voice of the 4 children who had had a tracheotomy. One of the 26 persons who had had intubation and tracheotomy was moderately hoarse and 1 extremely hoarse; the rest showed no changes. Eleven of the 51 patients had had repeated attacks of mild croup.

Journal-Lancet, Minneapolis

62:389-418 (Nov.) 1942

Consideration of Clinical and Public Health Aspects of Trichinosis. W. H. Wright, Bethesda, Md.—p. 389.
Gastroscopic Observations in Duodenal Ulcer. J. B. Carey and R. S. Ylvisaker, Minneapolis.—p. 394.
Incoordination and Tension Due to Anxiety. S. Blanton, New York.—p. 398.
Incidence of Tuberculosis in Negroes of College Age. H. M. Payne, Washington, D. C.—p. 400.
War Injuries of Chest. F. I. Terrill, Deer Lodge, Mont.—p. 403.
Emergency Treatment of Fractures. S. R. Maxeiner, Minneapolis.—p. 406.
Treatment of Anterior Poliomyelitis. J. D. B. Galloway, Minneapolis.—p. 411.

New York State Journal of Medicine, New York

42:2271-2364 (Dec. 15) 1942

Prevention and Treatment of Postoperative Pulmonary Complications. C. Eggers, New York.—p. 2293.
Medical Aspects of Diabetic Surgery. H. F. Root, Boston.—p. 2296.
Sigmoidoscopic Diagnosis of Systemic Disease. J. Felsen, New York.—p. 2303.
Sulfonamide Therapy in Dermatology: Observations in 261 Cases at Bellevue Hospital. M. J. Costello, A. M. Rubinowitz and S. E. Landy, New York.—p. 2309.

Public Health Reports, Washington, D. C.

57:1791-1842 (Nov. 27) 1942

Distribution of Health Services in Structure of State Government: VII. Maternity-Child Health Activities by State Agencies. J. W. Mountin and Evelyn Flook.—p. 1791.
*Superficial Vascularization of Cornea: Result of Riboflavin Therapy. H. R. Sandstead.—p. 1821.

Superficial Vascularization of Cornea.—Sandstead discusses the prevalence of superficial vascularization of the cornea in groups of school children, youths and adults of various sizes and the effect that riboflavin therapy had on the condition. The 366 persons examined were residents of Hagerstown, Md., or its immediate vicinity. Fifty-two of those examined were given riboflavin. From 80 to 95 per cent of a group had some degree of corneal invasion by capillaries. Corneal invasion was relatively more frequent and more severe among the older groups of persons. Of the parochial school children 67 per cent had no more than two quadrants, of the National Youth Administration youths 17 per cent had only two quadrants affected and among the older group the figure was 30 per cent. The corneal vascularization of 15 older subjects who had received 615 to 1,630 mg. of riboflavin during at least sixty days was not significantly different from that of 15 control persons of similar age. Likewise the therapeutic effect was similar in the 11 parochial school children given 5 mg. of riboflavin daily for forty-nine days and the 11 controls. It appears doubtful that superficial corneal vascularization is a diagnostic sign of riboflavin deficiency.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

54:283-312 (Nov.) 1942

Skin Manifestations of Meningococcic Infection. G. B. Mitchell-Heggs. —p. 283.

British Medical Journal, London

2: 567-596 (Nov. 14) 1942

*The Health of the Doctor. A. H. Gosse.—p. 567.
*Clinical Significance of Rh Factor. K. E. Boorman, B. E. Dodd and P. L. Mollison.—p. 569.
Optimal Proportions of Antigen and Antibody in Tests for Rh Antibodies. G. L. Taylor, R. R. Race, Aileen M. Prior and Elizabeth W. Ikin.—p. 572.
Physical Treatment of Acute War Neuroses: Some Clinical Observations. W. Sargant.—p. 574.
Night Vision in the Army. B. W. Rycroft.—p. 576.
Bagassosis: Further Notes of Four Cases. J. A. Gillison and F. Taylor. —p. 577.

Health of the Doctor.—Gosse discusses the amount of ill health and its various causes among 8,884 medical men from 25 to 65 years of age. The year 1938 was chosen for a detailed analysis, as it was the last prewar year and there was no epidemic. The ill health of the doctor is divided into those diseases which cause death and those which disable him from following any part of his professional work for at least seven days. The mortality of the doctors increased in each decade. As each man is exposed to the annual death rate for his decade for ten years before he passes into the next decade, his risk for each decade must be ten times the annual risk; in other words 3 out of 4 doctors live to be 65. There were forty-one deaths among the 8,884 men. To determine the causes of early death among doctors the author, in addition to the year 1938, also took the year 1939 and up to May 1940 so as to get a hundred consecutive deaths among the 8,884 doctors. The causes were cardiovascular degeneration in 17, malignant growths in 15, pneumonia (pleurisy) in 12, coronary thrombosis in 10, hemiplegia in 9, suicide, misadventure and accident in 12, pulmonary tuberculosis in 4, disease of the right side of the heart in 3, congenital aneurysm in 2, various infections in 11 and the rest 1 each from aortic aneurysm and prostatic, blood and ulcerative (duodenal) disorders. During 1938, 1,620 of the 8,884 doctors were ill for more than a week, a total of 10,982 weeks. Of the 1,620, registered medical practitioners certified 351 as suffering from respiratory infections, 276 from influenza, 100 from accidents and less than 100 each from inflammation of connective tissue, anxiety state, fibrositis, appendicitis and infections of the hand; less than 50 each from disorders of the special senses, peptic ulcer, disorders of the central nervous system, degenerative cardiovascular disease, pyelitis, cystitis and pneumonia; less than 20 each from pulmonary tuberculosis, renal disease, gallbladder, jaundice, mumps, asthma, coronary thrombosis, rheumatic and osteoarthritis, acute rheumatism, insanity, colitis, malignant growths and pleurisy; less than 10 each from auricular fibrillation, measles, scarlet fever, diphtheria, prostatitis, chickenpox, ischiorectal abscess, angina pectoris, glandular fever, erysipelas, gout, whooping cough, diabetes, hyperthyroidism, valvular heart disease, undulant fever, thyroid disease and typhoid, and 156 from unclassified causes. As a check on these figures the amount of sickness among 100 consecutive doctors who had reached the age of 65 was investigated. They had been under observation for an average of thirty and three-fourths years and had suffered 3,314 weeks of illness—that is, an average of seven and five-tenths days every year from the age of 35 to 65. Seven of these 100 doctors did not have a week's continuous illness during their working lives. That coronary thrombosis is "the doctor's disease" is challenged by the author. He found that the parental history as to cardiovascular degeneration was the same for 37 doctors in whom coronary thrombosis developed as for a control group of 37 who were still working at the age of 65, both of which groups were passed as fit at 30. The parental history for pulmonary tuberculosis was the same for 37 doctors in whom pulmonary tuberculosis developed as for a control group of 37 still working at the age of 65, both of which groups also were passed as fit at 30.

Clinical Significance of Rh Factor.—In every case of erythroblastosis that Boorman and his associates examined, the serum of the mother contained an immune agglutinin which was incompatible with the infant's erythrocytes. In 44 of 48 cases the agglutinin was anti Rh. In the remaining 4 it was either anti A or B. Because of this latter observation it is considered that the anti A and B agglutinins are capable of destroying the erythrocytes in a certain number of infants and thus of being the main causative factor of the erythroblastosis in some instances. The finding of weak Rh antibodies in the serums of the mothers of some babies with "physiologic jaundice" supports the idea that there is no clearcut distinction from the clinical point of view between mild and severe jaundice of the newborn. At present, if serologic tests are used to aid the diagnosis of doubtful cases of erythroblastosis, compatibility of the mother's serum with the infant's erythrocytes may be regarded as a strong point against the diagnosis, provided the mother's serum is examined by a sensitive technic seven to twenty-one days after delivery. On the other hand, if the mother's erythrocytes are Rh negative and her serum contains anti Rh agglutinins, the diagnosis is strongly supported. A change in the method of selecting blood donors is urgently needed, particularly in the transfusing of recently delivered women and whenever there is any suggestion that the infant is affected with erythroblastosis or when there is a history of the previous birth of jaundiced or unexplained stillborn babies. At the same time the present method of testing for compatibility between the bloods of donor and recipient must be modified. Every blood bank should establish a panel of group O Rh negative donors.

Lancet, London

2:563-590 (Nov. 14) 1942

Juvenile Rheumatism: Its Problems. R. Miller.—p. 563.
*Sulfonamide Sensitization. D. Erskine.—p. 568.
Ascorbic Acid in Meals at British Restaurants and School Canteens. R. G. Booth, G. V. James, J. R. Marrack, W. W. Payne and F. Wokes.—p. 569.
Shock: Treatment by Direct Action on Vegetative Nerve Centers. Leda S. Stern.—p. 572.
Treatment of Pulmonary Tuberculosis by Lung Puncture. C. R. Lavalle. —p. 573.
Absorption and Excretion of Oxalate. J. F. Barrett.—p. 574.

Sulfonamide Sensitization.—Erskine recommends that whenever possible small doses of the sulfonamides be used in some chronic infections so as to desensitize the patient, especially as the drugs are used for so many common illnesses and the fact that a patient in whom a sensitivity of this type develops may remain allergic for a long time. Sometimes the first tablet given months later may provoke an immediate return of a dermatitis with general symptoms, and these reactions may occasionally be of an alarming nature. Delayed reactions have not been observed when desensitization was undertaken at the time of the reaction. If chemotherapy is restricted, whenever possible, to seven days or less the incidence of allergic sensitivity is considerably reduced. Sensitivity almost invariably appears between the eighth and tenth days of treatment and depends more on the factor of time than on the total dose employed. Occasionally delayed reactions appear up to forty-eight hours after chemotherapy has been stopped, so that administration for more than six days makes sensitivity a possibility. Absorption from local applications as well as oral or parenteral administration may lead to sensitization phenomena. Desensitization should be undertaken immediately if eighth day "allergic" sensitization is encountered. The drug should be withheld if Werner's test indicates drug retention. In photosensitization the drug may be safely continued if further exposure to sunlight is avoided.

Tubercle, London

23:195-214 (Sept.) 1942

Hemomechanics and Sedimentation Rates. R. B. Whittington and A. K. Miller.—p. 195.
*Clinical Trial of "Tubercle Endotoxoid" in Pulmonary Tuberculosis. W. G. Bridges.—p. 205.

"Tubercle Endotoxoid" in Pulmonary Tuberculosis.—Bridges compared the effect of endotoxoid in 100 cases of pleuropulmonary tuberculosis with an equal number of cases under identical conditions and given the same treatment but no endotoxoid. The drug used was tubercle endotoxoid, prepared

according to Grasset's formula by a British manufacturing chemical firm: "a preparation of the tubercle bacillus from which the toxicity . . . has been eliminated." During the first week two doses of 0.05 cc. at an interval of three days were given subcutaneously. Thereafter two weekly doses were given; every week the dose was increased by 0.1 cc. until two doses of 0.5 cc. were given in one week, then one dose of 1 cc. fortnightly for a further two months, making a total period of six months of treatment. From the data obtained, tubercle endotoxoid had no influence on the course of tuberculosis of the adult type in this country. There was, seemingly, a possible but unproved comparative benefit to patients treated by artificial pneumothorax and to those with bilateral disease, but this possibility carries no weight, owing to an insufficient number of patients and other factors.

Schweizerische medizinische Wochenschrift, Basel

72:805-832 (July 25) 1942

Treatment of Dysmenorrhea and Its Causes. A. Labhardt.—p. 805.
*Eosinophilic Pulmonary Infiltration: Pathologic Anatomy and Pathogenesis. H. von Meyenburg.—p. 809.
Voice and Speech of Cretins. R. Luchsinger.—p. 811.
*Relation Between Sugar Absorption and Phosphate Metabolism in Rickets. L. Laszt and L. Dalla Torre.—p. 817.
*Modification of Whooping Cough by High Altitude Flights or Low Pressure Chamber. P. Lauener and E. Maeder.—p. 819.
Asthma and Histamine Therapy. A. Dudan.—p. 821.

Eosinophilic Pulmonary Infiltration.—According to von Meyenburg, transient pulmonary infiltration with eosinophils, first described by Löffler in 1932, is a benign disorder. The author reviews postmortem observations on 4 patients, 3 of whom died as the result of military accidents and a fourth of a traumatic tetanus of short duration. The first man died following a gunshot wound which had caused hemorrhage from a torn renal artery. The right lung contained two dense, airless foci the size of a plum and a cherry respectively. These were believed to be ordinary bronchopneumonic foci. Since the man had been healthy, it was supposed that he had had a mild influenza and that the dense pulmonary foci represented a residue of nonabsorbed inflammatory areas. It was disclosed that four weeks before the man had had a mild influenza without pulmonary symptoms. Microscopic study of the pulmonary tissue revealed a large number of eosinophils, while examination of other organs revealed eosinophilia of blood and bone marrow. In 2 of the other 3 cases ascarids were discovered in the intestine. Two of the 4 patients had bronchitis and bronchiolitis; these 2 patients had bronchopneumonia, the others had lobar pneumonia. The author believes that these cases present an anatomic substrate of a transient pulmonary infiltrate with eosinophils, though he is not able to furnish proof of its transient nature. The pathogenesis, or rather the route of development, is not always the same. Evidence is presented that there is not only a bronchogenic but also a hematogenic development and that eosinophilic infiltrates occur not only in the lungs but also in other organs. There is evidence of a possible relationship between epididymitis and pulmonary infiltration. His studies furnish no evidence of bacteriologic nature. Possible etiologic significance of animal parasites is admitted. The author concludes that eosinophilic pulmonary infiltration is an inflammatory, allergic reaction to various antigens which may enter the body by various routes.

Sugar Absorption and Phosphate Metabolism in Rickets.—Laszt and Dalla Torre state that, although rickets has long been recognized as a vitamin deficiency disease, knowledge of the rachitic metabolic processes and of the effect of vitamin D on it is still inadequate. As the chief disorders in rickets they mention disturbances in the ossification, in the intestinal absorption and in the intermediate metabolism. They cite observations which indicate that in rickets a change in the composition of serum is more important than disturbances of the bony system. The inorganic phosphate content is greatly reduced in rachitic serum, and it is assumed that the phosphate cannot be absorbed from the gastrointestinal tract. The authors had observed earlier that carbohydrates during absorption from the small intestine exert a specific stimulus on the phosphate secretion. This secreted phosphate causes the selective absorption of monosaccharides. If the retroabsorption of the secreted phosphate is inhibited, the selective sugar absorption ceases. Thus, if the phosphate absorption is disturbed, this would have to be evident in the sugar absorption. The authors investigated this on rats. 1. They were able to prove that in rachitic rats the absorption of phosphates from the small intestine is inhibited. 2. There exists an inhibition of reabsorption of the phosphate secreted in the intestine during the sugar absorption. 3. The slow reabsorption of the secreted phosphate causes an inhibition of the sugar absorption. 4. Calcium chloride and calcium lactate absorption exert no stimulus on the secretion of phosphate. 5. The conclusion is reached that vitamin D acts as a transformer of phosphate in that it transforms free phosphate to sugar. The rachitic metabolic disturbances are ascribed to the deficiency of this transformation in the organism.

Treatment of Whooping Cough by High Altitude Flights.—Lauener and Maeder review observations on 244 infants and children and on 12 adults who were subjected to high altitude flights in the course of the convulsive stage of whooping cough. The duration of the flights was usually ninety minutes, and about half of this period (forty minutes) was spent at altitudes of from 3,500 to 4,000 meters. The majority of the flights took place in the forenoon. The weather conditions were not always favorable for the flights. Rapid sliding flights from high altitudes were avoided because they produced pain in the organ of hearing. The children showed practically no fear or anxiety in the plane. The majority of infants and young children began to sleep at altitudes over 2,000 to 2,500 meters and wakened only on landing. The authors think that this is due to oxygen deficiency together with the monotonous noise of the motors. Nausea or vomiting appeared in about 30 per cent of the children and adults, but no vomiting was seen in infants. A critical evaluation of the 250 cases on which data are available reveals that in 69 (27.6 per cent) the high altitude flight produced no effect whatever; in 5 children there was exacerbation. In the other 181 noticeable and striking effects were observed. In 57 (22.8 per cent) the flight was effective either immediately or within two or three days; in 80 more (32 per cent) the cure was not so rapid; nevertheless a considerable improvement was observed within a comparatively short time. In about 55 per cent the effects were quite favorable. In the remaining 44 (17.6 per cent) the effect was not striking although not entirely negative. Twenty-four were taken by automobile to an altitude of 3,450 meters and remained there for three hours; 16 of the 24 showed a slight to noticeable improvement after this trip, but in some the improvement was only temporary. The authors review observations on 68 patients who were treated in the low pressure chamber with an average stay of sixty minutes. Rapid cure was obtained in 31 per cent, improvement in 50 per cent, no betterment in 16 per cent and exacerbation in 3 per cent. The authors conclude that high altitude flights, as well as the low pressure chamber, exert a favorable effect on whooping cough. The low pressure chamber has the advantage that it is independent of weather conditions.

Pediatria Prática, São Paulo

13:1-98 (January-February) 1942. **Partial Index**

*First Week of Life of Premature Infants. R. Kohan Y.—p. 5.
Necessity of Treatment of Caries of Temporary Teeth. A. Campos de Oliveira.—p. 21.

First Week of Life of Premature Infants.—Kohan Y. observed 4,680 infants who were born at a maternity hospital during the years 1938, 1939 and 1940. There were 585 premature infants (12.5 per cent); 48 per cent were born of unmarried mothers. Syphilis played an important role in the pathogenesis of prematurity, which was more frequent in multiparas than in primiparas. Proper care and administration of testosterone propicnate improved the vitality of the premature infants. The rate of mortality in this group was 18.6 per cent. Obstetric manipulations increase the rate of mortality. Congenital syphilis, intracranial hemorrhage and congenital weakness are the main causes. These may be favorably influenced by intensification of the crusade against syphilis, protection of unmarried pregnant women by placing them in better social and economic conditions and by an increase in the number of medical and social centers for free medical care.

Book Notices

Urological Diseases of Pregnancy. By E. Granville Crabtree, M.D., Urologist to the Boston Lying-in Hospital, Boston. With a signed chapter by George C. Prather, M.D., Assistant Urologist to the Boston Lying-in Hospital. Cloth. Price, $6.50. Pp. 472, with 159 illustrations. Boston: Little, Brown & Company, 1942.

This exceptionally complete treatise on the urologic diseases of pregnancy shows a wide experience in the urinary complications in gravid women and an extraordinary familiarity with the work of others in the field. There is a scope which is unusual in a volume devoted to a subject which superficially does not seem to have as many facets as the author most effectively discovers and describes. Most urologists at large hospitals which have active maternity services have come face to face with most of the problems which this volume recites, but few have taken the profound interest in them or have acquainted themselves with the many changes affecting the gravid and parturient woman in relation to the urinary tract and other systems of the body. The large bibliography represents only those contributions which have been carefully analyzed and those of some value in clarifying the entire subject.

The importance of hormonal influence in pregnancy is stressed and the statement that "when this glandular response is abnormal, pathological changes are inevitable" is noteworthy. There are a few illustrative quotations which may be cited: "The response of the human body to pregnancy influences seems to follow a fairly constant pattern, certainly so far as the urinary tract is concerned. . . . While the composite curve is true to the form mentioned, there are individuals in whom there is apparently no change whatever in the urinary channels during pregnancy. . . . No explanation has been offered as to why one individual seems to respond to pregnancy more than another."

Chapter 6 is devoted to the effect of pregnancy on anomalous and preexisting pathologic conditions of the urinary tract. Here is considered solitary kidney, abnormal mobility of the kidney and malposed kidney. The subject is thoroughly covered. In chapter 9, besides other interesting data, the experimental work showing the effect of pregnancy hormones on the isolated ureter is abstracted. Chapter 12 contains a thorough exposition of infections of the urinary tract and comprises fifty-three pages. Chapter 14 is devoted to the treatment of urinary tract infections, and a mature evaluation of the various drugs in vogue is given. Again a few quotations may be cited: "In the low acidification therapy the diet which is tolerated by most pregnant women is not adequate for the cure of the infection. There is little to commend the ketogenic diet in comparison with other available antiseptics. . . . Quoting Krueger and Scribner (1941), 'Theoretically, uncomplicated infections of the urinary tract should offer potentialities for the application of the phage therapy. They are usually well localized processes and the tissues involved are readily accessible, so that almost any desired amount of phage can be brought in contact with them. Nevertheless, there is little in the published results to suggest that phage therapy has any significant superiority over the common chemotherapeutic approaches.'"

Other subjects are equally well described in subsequent chapters. In chapter 21 the subject of fluid balance in pregnancy and the puerperium should be of great interest to the urologist from a mechanical point of view in relation to residual urine and retention after delivery, because "he should not treat a patient to her disadvantage through lack of knowledge of the fundamentals of fluid behavior in relation to gestation." It has been shown that the percentage of output of water in normal pregnancy indicates a progressively decreasing ability to handle fluids with a moderate rise near term.

Chapter 34 deals essentially with renal insufficiency from blood transfusion. This subject also is of great importance, because often the need for blood replacement in postdelivery cases is urgent and the amount of blood required may be a large percentage of the blood volume of the patient at the time of transfusion.

In general this volume, which is attractively printed and illustrated, may be considered a milestone in urologic literature in that nearly five hundred pages is devoted to a subject which heretofore has been but lightly touched on in most books on urology. Its value to the obstetrician will be as great as to the urologist.

Revelation of Childbirth: The Principles and Practice of Natural Childbirth. By Grantly Dick Read, M.A., M.D. Cloth. Price, 21s. Pp. 262. London: William Heinemann, Medical Books, Ltd., 1942.

Ten years ago the author published a monograph entitled "Natural Childbirth" which created considerable discussion. The present volume elaborates the author's aims and methods and presents a record of some of his clinical results. The thesis expounded is that human reproduction is a normal, natural, biologic process. Pregnancy and labor should be conducted in this light so that they remain natural and unassisted. The pain associated with uterine contractions is the result of fear engendered by generations of ignorance, misconception and false teaching. We do not fear facts but doubts and uncertainties. The fear of parturition has become the great disturber of the neuromuscular mechanism of labor. Pain is caused by tension; tension is caused by fear. Tension leads to cervical dystocia.

If one accepts the theory that pregnancy and labor is a normal physiologic process which should be devoid of pain and that pain is the result of fear, then the management of normal pregnancy and labor should include the elimination of fear. The author accomplishes this objective by education. His antepartum care includes the usual safeguards for the prevention of the hazards of childbirth, and in addition a serious attempt is made to influence the mind of the patient. All efforts are directed toward impressing the pregnant woman to regard labor as a normal uneventful biologic process devoid of pain, discomfort and other pitfalls. Anxiety is removed by a careful explanation of all the facts which enter into a normal pregnancy and subsequent labor. Each antepartum visit drives home the fact that reproduction is normal and therefore uneventful. As an adjuvant to this peace of mind which the healthy mother should develop, she is taught to relax. Systematic exercises promoting physical relaxation is introduced at four or five months and continued to term.

Labor is conducted as naturally as possible. During the second stage the patient has access to an inhalation anesthetic which she can use at will, but she rarely resorts to it. Thus, some analgesia is offered to her, but her education is so complete that labor is an uneventful process. The pains that are associated with the final completion of the dilatation of the cervix are probably traumatic and should be relieved by firm rubbing or hard pressure on the sacrum. The relative anesthesia of the perineum which makes it possible for the author to repair superficial tears without anesthesia is probably due to the trauma to which the perineum has been subjected and not, as the author would have one believe, the result of the exalted state which the patient has achieved at the birth of the baby. Anesthesia is reserved for the abnormal or surgical delivery, in which real physical pain is due to laceration, excessive stretching and tension of the birth canal.

This small volume should be read by every obstetrician and student of the physiology of reproduction. No one can deny that emotional influences play a profound role in pregnancy and labor. It is true that pregnancy and parturition have become a pathologic state in the eyes of most physicians comparable to a major disease. It is equally true that few women in our large maternities deliver naturally. However, pain relief is here to stay even though the perfect analgesic agent has not been found. The author's argument that "anesthesia in cultural labor is given primarily to satiate the escape demand of fear" will not deter the ever increasing widespread use of analgesia and anesthesia. In spite of the conversion of a physiologic function into a pathologic state, pregnancy and labor have become increasingly safer for mother and baby. The hazards of childbirth are rapidly disappearing. Our women are restored to normal mental and physical vigor, thereby often cheating them of extensive gynecologic reconstruction or a lifetime of invalidism. The spirit of the crusader is discernible in the declaration of the author "When as a lonely wanderer I first

set out to investigate the emotional influence of pregnancy and parturition, it was the paradox of pain in a biological design that urged me on. For a year my professional life hung in the balance as pregnant women hurried by my door as scalded cats, but in spite of all it is more satisfying to be nobody with something than somebody with nothing." This spirit should be admired.

The author dedicates this monograph to the late Joseph B. De Lee, a fellow crusader in the interests of safer motherhood, for his kindly interest in his work and his personal friendliness and appreciation.

Constitution and Disease: Applied Constitutional Pathology. By Julius Bauer, M.D., Professor of Clinical Medicine, College of Medical Evangelists, Los Angeles. Cloth. Price, $3.50. Pp. 208, with 4 illustrations. New York: Grune & Stratton, 1942.

The rapid advances in chemotherapy have brought a shift in the relative importance of those extrinsic pathologic factors, particularly infectious diseases, which until recently have held the center of the stage in producing human misery and death. For somewhat obvious reasons medical curriculums in this country have lagged in presenting the constitutional or hereditary factors involved in human pathology. This work, by a prominent European clinician for many years professor of medicine at the University of Vienna, is therefore particularly timely. Dr. Bauer states in his preface "This little book may stimulate medical thinking and critical sense in evaluating old and new, actual and apparent facts in medicine. It may help to promote good judgment and common sense in practicing medicine and in digesting current medical literature as well. It should be considered as a supplement to the routine medical curriculum. By virtue of these objectives it may contribute to the ultimate aim of medicine: to help the sick, or, as Trudeau used to say, to cure sometimes, to relieve often, to comfort always."

The author has drawn freely from his own clinical experience and from the medical literature in presenting facts illustrating the human hereditary complex. He has wisely avoided giving detailed family pedigrees, has emphasized the fact that predispositions often have an important hereditary background though the modus operandi of specific genetic factors may at present be unknown, and has stressed the importance of a knowledge of heredity in the etiology of disease even where this knowledge cannot at present be used in treatment. In chapter III, on constitutional biologic inferiority of organs and tissues, much evidence is presented on the hereditary nature of defects, actual and latent, involving specific organs and tissues. Chapters IV and V treat respectively the endocrine and nervous systems in their integrating roles and the interplay between these and the genetic constitution, the sum total of the genes and the phenotypic constitution, the human body and its component organs. The discussion is at points needlessly involved, but the main thesis that the hereditary complex is primary and that endocrine and nervous relationships are secondary is sound. Chapter VI presents a critical evaluation of constitutional types and chapter VII deals with some major diseases with chiefly constitutional etiology. The inheritance of diabetes mellitus, obesity, constitutional hypertension, diseases of the hemopoietic system, peptic ulcer and cancer are discussed. A short concluding chapter touches on principles of treatment, nonspecific therapy and pitfalls and errors, particularly in endocrine diagnosis and therapy.

From the genetic standpoint the book is for the most part accurate. The author has correctly emphasized the importance of the study of uniovular twins, the pleiotropic or multiple effects of certain specific hereditary units or genes, and the variety of expression of given genes and gene combinations in different genetic (constitutional) and environmental (including therapeutic) backgrounds. The reviewer would criticize his interpretation of certain syndromes as due to linked genes rather than to the pleiotropic action of one gene in different genotypes, and his ambiguous and unorthodox use of the terms dominant and recessive in connection with sex determination. The wise use of psychotherapy and the consideration of the constitutional background of the patient in diagnosis and treatment are stressed. This book will prove valuable to all who are interested in human biology and pathology but is recommended particularly to young practitioners and medical students. An extensive bibliography is included.

Do hipertireoidismo e seu tratamento. Por Ulysses Lemos Torres, livre docente de Clinica medica da Escola paulista de medicina, São Paulo. Paper. Pp. 342, with 43 illustrations. São Paulo: Empresa gráfica da "Revista dos tribunais" Ltda., 1942.

The subject matter is arranged in sixteen short chapters. To each chapter is appended a selected bibliography and each reference is specifically quoted in the text. In the first four chapters the author reviews the embryology, histology and chemistry of the thyroid gland. The essential facts as we know them are briefly and clearly presented. One chapter gives a summary of the relations of the vitamins to thyroid function and reflects the popularity of the subject rather than any specific relation to thyroid disease. The next ten chapters are devoted to a discussion of hyperthyroidism, its general etiology, varied symptomatology, pathology and classification of types of the disease. Fifteen clinical reports are given in detail to illustrate these types and stages of the disease. Separate chapters are devoted to toxic adenoma and iodine hyperthyroidism. Typical clinical reports of such cases are included. The region around São Paulo is one of the world's important districts of endemic goiter, and both toxic adenoma and iodine hyperthyroidism are more common in endemic goiter districts. The author thinks that the distinction between toxic adenoma and toxic diffuse goiter is justified and should be attempted in every case despite the general accuracy of Wolf's dictum that "goiter plus symptoms equals adenoma and symptoms plus goiter equals Graves' disease [toxic diffuse goiter]." The final chapter deals briefly but clearly with medical and surgical treatment. The author points out that the type and stage of the disease, also the social and economic condition of the patient, must be taken into consideration in deciding on the best treatment. Certain types such as toxic adenoma or cases complicated by fibrillation or diabetes require operation at the first opportunity. Early or mild cases of toxic diffuse goiter should be treated in the first instance medically with rest, sedatives, vitamins, hormone preparations (estrogens and insulin mainly), iodine, bromine and quinine. He devotes several pages to a review of Kazakov's polyglandular lysate treatment. Surgical treatment has the advantage of providing immediate relief in properly selected and prepared cases. This monograph is a well balanced, conservative summary of the subject and should serve a highly useful purpose for physicians who are familiar with the Portuguese language and who require more than the brief account in textbooks.

Practical Survey of Chemistry and Metabolism of the Skin. By Morris Markowitz, M.D., Associate in Dermatology and Syphilology, Graduate School of Medicine, University of Pennsylvania, Philadelphia. Fabrikoid. Price, $3.50. Pp. 196. Philadelphia: Blakiston Company, 1942.

The purpose of the author is "to give to the student and practitioner of medicine a general survey of fundamental facts necessary for a better understanding of dermatology." In a concise and well organized presentation divided into part I, on the chemistry of the skin, part II, hematology, part III, blood chemistry and part IV, vitamins in dermatoses, we are given a better conception of the close relationship between internal medicine and related cutaneous manifestations. In spite of its small size the author has succeeded in covering an enormous amount of territory. For those who wish more complete information a well selected bibliography is found at the end of each section. The worth of the book could be improved by the addition of a few illustrations, especially where cellular pathology is concerned. Also closer attention to proofreading would eliminate several errors. The author is to be congratulated on giving so much in so few pages and strengthening the pattern of dermatologic thought, which is attempting to place diagnosis on a firm basis of physiobiochemical changes rather than on long latinic words and phrases. The book is highly recommended.

Recent Advances in Obstetrics and Gynæcology. By Aleck W. Bourne, M.A., M.B., B.Ch., Obstetric Surgeon to St. Mary's Hospital, London, and Leslie H. Williams, M.D., M.S., F.R.C.S., Obstetric Surgeon to Out-Patients, St. Mary's Hospital. Fifth edition. Cloth. Price, $5.50. Pp. 363, with 72 illustrations. Philadelphia: Blakiston Company, 1942.

Most significant in the discussions in this volume are the chapters on sex hormones, ovarian tumors and the uses of roentgenology in obstetrics. Especially worth while is the discussion on cancer and the excellent results now achieved by early diagnosis and proper treatment. Special emphasis is placed on the development of postpartum care to a status resembling that of antepartum care.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

GENETICS OF HUMAN CANCER

To the Editor:—What is the present opinion as to heredity in the transmission of cancer from parent to offspring? Is it a dominant mendelian characteristic? Is there any evidence, besides that of rats, that this tendency is inherited? If so, do the same kinds of cancers occur in the progeny as in their forebears? Does this heredity factor vary in different types of cancer? What recommendation would you give to a person contemplating matrimony with a person one of whose parents has been a victim of cancer?

Lieutenant, M. C., A. U. S.

ANSWER.—The genetics of human cancer are too unknown, too complicated, to discuss dogmatically at the present time. Certainly some rare malignant growths, as for example malignant glioma of the retina or the less malignant neurofibromatosis, have a strong hereditary background. But for the common types of carcinoma the evidence is for the most part not clear as to just what influence heredity has; and for that matter the genetic pattern of cancer in mice and rats is far from clear, with nongenetic factors coming into play in some of them. Certainly multiple polyposis of the colon with its common malignant change is a familial disease, at least in some instances, but to say that carcinoma of the colon is ordinarily on a hereditary basis would be going much too far. There is some statistical evidence that cancer of different organs tends to occur more frequently in persons with relatives with cancer in the same organs than in those with no such relatives, but the evidence is slight indeed and certainly shows no pronounced influence of heredity in the production of cancer. As to recommendations concerning matrimony with a family history of cancer, there should be no hesitation in the case of a person who has had one parent a victim of cancer, unless the cancer was one of those rare cases of glioma of the retina, neurofibromatosis or one of the few other neoplasms with a strong hereditary background. If there has been cancer in both sides of the family involving the same or equivalent organs, consultation with some one familiar with the genetics of cancer is to be recommended.

DYSCHONDROPLASIA

To the Editor:—I have a patient with dyschondroplasia. Is there any treatment that may be of benefit? The parents will allow the child to be placed in an institution for research purposes.

J. Lewis Fretz, M.D., Seattle.

ANSWER.—There is no treatment for dyschondroplasia which offers any hope of improving the condition. Both vitamins in varying amounts and mixtures and preparations of the glands of internal secretion have been used without any definite evidence of benefit. This is a condition which is probably due to a primary germ cell defect and as such offers little hope of improvement as the result of therapy. One of the Shriner hospitals for crippled children or an orthopedic service in connection with one of the medical schools would probably be willing to accept this child for care.

BREAST NURSING AND GALACTAGOGUES

To the Editor:—A woman aged 41 had her first baby recently, but she does not have enough milk for the baby. What is the best preparation to give the mother to stimulate the secretion of milk? What about vitamin B complex or glandular preparations?

M.D., Oklahoma.

ANSWER.—Specific galactagogues, whether in the form of food or of drugs, are no longer advocated. Heredity is an important factor: the ability to nurse is commonly transmitted from mother to daughter. The nervous or mental condition of the mother is an important factor in her ability to nurse. Plenty of rest, calm environment and moderate exercise are advisable. A well balanced diet containing about 1 quart of milk daily and total fluids of 2 quarts is advisable. The real stimulus to milk secretion is thorough emptying of the breast. If the baby fails to empty the breast, this should be done by manual expression or a breast pump.

PROBABLE RENAL COLIC FROM STONE AND DIAPHRAGMATIC PLEURISY

To the Editor:—On July 13, 1942 a laparotomy was performed on a man aged 34. Early symptoms at the onset of his illness two days earlier were suggestive of the urinary tract with pain in the right costovertebral angle referred down around the flank with extension to the back of the penis. He had dysuria with frequency, but the urine appeared clear amber even though it contained 5 red blood cells per high power field. The urine was otherwise negative. The white blood count was 8,800. When the abdomen became rigid on the second day, operation was performed. The appendix was long, fibrosed and not acutely inflamed. The left and right kidney were fused on the right side with the right kidney pelvis facing outward and backward to the right side. A retrograde pyelogram showed that the left ureter entered the bladder on the usual left side and extended upward across the midline to the left kidney fused to the lower pole of the right kidney. This kidney pelvis faced normally to the midline. There was only slight hydronephrosis of the right (upper) kidney pelvis. The appendix was removed, but severe tenderness remained over the large kidney mass. The postoperative temperature ranged from 99 to 101 F., until the tenth day, at which time the tenderness had completely subsided. On his first day out of bed the patient suffered from a severe continuous pain in the left costovertebral angle, not relieved by morphine. The chest was clear; the gastrointestinal tract was normal; the patient voided small amounts of normal urine every forty-five minutes. The urinalysis showed a trace of albumin, an occasional white blood cell and a rare red blood cell. The left costovertebral angle was not tender. The pain began to subside after three days but was still evident to the patient two weeks later as a soreness. With the onset of this pain the temperature ranged from 101 to 103 F. The patient was discharged from the hospital on the twenty-first day after operation and two days after a retrograde pyelogram was done. About four or five days after this a severe left costovertebral angle pain developed and the patient began to have occasional deep involuntary respiratory inspirations that would begin with a yawning action. These occurred only two or three times each day while the patient was in the hospital, but after he was home they increased in frequency until they occurred as many times as eight in one hour. These were more prone to occur when the patient was sitting. He had no control over them whatever and said that he would start to yawn and would then get a feeling as if some one was giving him artificial respiration, only the reflex muscle action was always inspiratory. There was never a succession of such involuntary acts. Between the fifth and sixth week after operation these involuntary inspirations began to occur more frequently on walking. During the sixth week he had more dyspnea on walking up a flight of steps than he had had before and certainly more than his inactivity would produce. During the seventh and eighth weeks both the dyspnea and the involuntary inspirations began to diminish and become less frequent. Now these involuntary inspirations occur only two or three times each week. I would be interested in getting an opinion on these involuntary inspiratory spasms and also some idea as to the cause of the severe left costovertebral pain while in the hospital, since there is no kidney in that area on this patient. He is not of a neurotic nature. He is a steel welder.

M.D., Pennsylvania.

ANSWER.—This is an interesting presentation but unfortunately does not give all the information one would like to have in order to make a definite diagnosis. However, there are several points that stand out clearly and forcefully. In the first place, the original attack that the patient had can be called a renal colic due to stone. The inference that the patient had a renal colic due to stone is based on the sudden onset of pain in the right costovertebral angle referred to the back of the penis associated with dysuria and frequency and the presence of red blood cells in the urine. The white blood count was 8,000, which is compatible with renal colic. The retrograde pyelogram disclosed a slight hydronephrosis of the right kidney pelvis. The patient was operated on and an appendectomy was performed. The reason for this is not clear from the evidence presented and from the symptoms mentioned. At operation the appendix was found to be not acutely inflamed. Following the operation the patient had a temperature that varied from 99 to 101 F., which was associated with frequency of urination, albumin, red blood cells and white blood cells in the urine. This is compatible with an acute pyelitis following the operation. This part of the query seems perfectly clear.

With regard to the respiratory inspirations that began with a yawning action associated with dyspnea on walking up a flight of stairs, this sounds, without a physical examination and without more evidence, like an attack of diaphragmatic pleurisy. Another possibility to consider is the fact that the patient may have had a little hiccup, but nothing is said about this.

The third point raised is the presence of left costovertebral pain while in the hospital. The correspondent wishes an explanation, since there is no kidney in this area. The left costovertebral pain may well be explained on the basis of a diaphragmatic pleurisy or intercostal neuralgia or neuritis or perhaps something in the spinal cord itself. It is exceedingly difficult to venture an opinion on the latter subject. It is noted that the correspondent states that the patient is not of a neurotic nature. This does not appear to be a neurosis in any sense of the word.

DISPOSAL OF OLD X-RAY FILM

To the Editor:—I am interested in a way to dispose of old x-ray films. Can you please suggest a method? Is there a collector for such films? I am a doctor's secretary and have been asked to dispose of some old films. I am under the impression that the chemicals coating the film are of some value in these days of conservation. Gertrude Fischer, New York.

ANSWER.—Old x-ray films can be readily sold for scrap, and the price paid per pound is fairly high at the present time. There are numerous jobbers in every city who will purchase the films, and the local chamber of commerce can be of help in making the selection of the best buyer. The classified section of the telephone directory may give a list of buyers, but usually the roentgenologist's mail contains numerous advertising letters and postal cards from individuals anxious to purchase scrap film. One should be careful to check the weight of the films and should obtain several quotations before selling.

SUBSTITUTES FOR RUBBING ALCOHOL

To the Editor:—The recent withdrawal of rubbing alcohol from sale except on the prescription of a licensed physician has brought up the question as to whether there is any solution that might be substituted for alcohol for that purpose. Can you tell me where I can obtain any information on this subject? William R. Dorr, M.D., Phoenix, Ariz.

ANSWER.—Isopropyl alcohol as included in the following formula has been used as a substitute for ethyl alcohol as a back lotion: isopropyl alcohol 25 cc., glycerin 10 cc., acetic acid 4 per cent 2.5 cc. and sufficient water to make 100 cc. Coloring and perfume may be added. A number of noninjurious emollient cream type body lotions and nongreasy skin oils that can be used as a substitute for rubbing alcohol are offered by several of the reputable pharmaceutical manufacturers.

SLEEP DISTURBANCES OF INFANCY AND CHILDHOOD

To the Editor:—Many parents complain that their child will not sleep at night; the child otherwise acts perfectly normal with no crying, fever or vomiting, but just refuses to sleep. Many will say that the child sleeps little during the day. I have carefully checked these children and found nothing essentially wrong; the increasing of the formula and the addition of sedatives have been of little value. I should appreciate your suggestions as to how to combat this problem.

Joseph A. Concello, M.D., Chester, Pa.

ANSWER.—There is a considerable variation in the sleep needs of infants and children. Many children require large amounts of sleep, while many others are perfectly happy and healthy on limited hours of sleep. There is no fixed number of hours that an infant must sleep.

Disturbances of sleep during the early months of life are usually due to physical causes such as hunger, colic, soiled diaper, the pain or itching of ammoniacal dermatitis or overdistention. Parental agitation also has an adverse influence on sleep during early infancy.

After the sixth month psychologic factors become more important. Sleep disturbances have their origin in a generally improper attitude toward the child and are rarely isolated symptoms. Other behavior problems are usually associated.

The best prophylactic against sleeping difficulties is a regular schedule rigidly adhered to. There should be no irregularity in the hour of retiring. Attention should be given to the following features: The habit of going to bed quietly should be established at an early age. There should be no rough, boisterous or exciting play late in the afternoon or early evening and no loud radio programs or undue excitement before bedtime. It is desirable to have a preparatory quiet period before attempting to go to sleep. The hour before bedtime should be a calm and happy one. No punishment should be meted out just before or at bedtime. Going to bed should mark the end of activity. Once a child has gone to bed, all bids for attention, as requests to go to the toilet, for water, to kiss goodnight again, should be ignored. The parent should not remain with the child until he has gone to sleep. If possible the infant or child should sleep alone in a room in which the temperature, ventilation and humidity are properly regulated. He should not be too hot or too cold. The room should be sufficiently isolated so that sounds from other rooms will not readily be heard, but it should not be necessary for adults to tiptoe about the house, as the infant must become accustomed to sleeping through a moderate amount of noise.

A warm beverage or a warm bath just before bedtime often helps to relax the child. However, once an undesirable sleeping routine has been established, the only method of cure is to allow the child to cry himself to sleep for a week or more if necessary. Each night he will cry for a shorter period until finally peaceful sleep ensues.

EPILEPSY ASSOCIATED WITH MENSTRUATION

To the Editor:—A married woman aged 29 has frequent petit mal-like seizures in which she loses consciousness for a second or two, drops what she is holding and jerks her hands a little. This is about all that occurs, as I have seen several of them. She was perfectly normal until catamenia at 12 years, when the attacks began to occur with each menstrual period, never missing one. In the interim she was quite well and free from attacks. On several occasions during a period she has had grand mal attacks and recently has had quite a few petit mal seizures between periods. The periods are scanty, lasting only three or four days, but otherwise are normal. At 14 years an air encephalogram was done by a well known neurosurgeon (now deceased), which apparently revealed no pathologic condition and gave no relief, although he suggested doing some sort of brain surgery from an occipital approach (decompression?). During her one pregnancy she was entirely free from attacks, which returned three weeks after the delivery. Her physical examination, other than for moderate obesity, is entirely normal. There are no signs of increased intracranial pressure or meningeal irritation. All laboratory work, including blood counts, urinalysis, blood sugar and basal metabolic rate, is normal. The patient has been told by doctors that a bilateral oophorectomy will cure the trouble, and she wants me to do this, as she has had no relief from either phenobarbital or phenytoin sodium in adequate amounts. The effect on her nervous system is already considerable. Assuming the results of a lumbar puncture, which I shall do in a few days, are negative, do you think the possibilities of a cure justify an oophorectomy? Have you any other therapeutic means to suggest? If oophorectomy has been done in similar cases, what has been the result? M.D., Washington.

ANSWER.—Rarely are a patient's seizures so definitely related to the menstrual function. Nevertheless there is no reason to believe that oophorectomy would lessen her seizures, and the operation undoubtedly would increase her physical and psychologic problems of adjustment. This operation apparently has not been reported in recent years. Older case reports are unconvincing (Ashe, J. S.: *Dublin J. M. Sc.* **4**:142 [May 20] 1920. Everke, C.: *Monatschr. f. Geburtsh. u. Gynäk.* **61**:256 [Jan.] 1923). Spratling, in his book published in 1904, stated that he observed improvement in 2 of 9 patients operated on. Even in patients with migraine, in which condition cessation of attacks at the time of menopause is the rule, artificial menopause is usually without benefit. Therefore oophorectomy is no more indicated than is occipital decompression, suggested fifteen years ago, designed to provide a freer flow of blood from the brain. The experimental use of theelin or other estrogenic substances would be preferable to the use of the knife. An electroencephalogram would be helpful in judging the severity of the case. If this examination should confirm the clinical diagnosis of petit mal, there is a good chance that these attacks will gradually disappear spontaneously. For the grand mal, a combination of phenytoin sodium, to the limit of tolerance, and of phenobarbital may be used.

AMPHETAMINE INHALATIONS AND CORONARY OCCLUSION

To the Editor:—In Queries and Minor Notes in The Journal Sept. 26, 1942, page 325, there was an inquiry regarding the advisability of using amphetamine for a patient with a recent coronary occlusion. In answer to the inquiry, it was stated that the consultant to whom the question was referred had observed no instances in which amphetamine appeared to have any effect on the coronary vessels, and it was stated that the drug might be used safely for inhalation by patients who had had a coronary occlusion. In view of these statements, I should like to call attention to the experience of 1 of my patients. This man had allergic rhinitis and had acquired the habit of using the amphetamine inhaler frequently. On Feb. 16, 1942 he purchased a new tube of this material and used it at intervals of a few minutes throughout the afternoon and evening. He felt "bad" and had a sense of "heaviness" throughout his body when he retired at 10:30 p. m. About 2 a. m. he was suddenly awakened by a sense of oppression in the precordium and great pounding of his heart. These symptoms lasted several minutes. After they were over, he was extremely weak and noticed tingling in his arms, particularly the left. The next day he was quite short of breath and again had tingling in his arms with even slight exertion. He did not consult me until two weeks later, but during this interval he was constantly short of breath and had numbness and tingling in the arms on the slightest exertion. An electrocardiogram taken at that time revealed normal mechanism, regular rhythm and a T wave poorly deflected in all leads. No formal diagnosis was made, but it was suggested that this picture might be the result of debilitating disease, asthenia from any cause, obesity or the like. He was kept in bed several weeks and the symptoms described disappeared. The electrocardiograms taken after the rest period showed some changes from the previous electrocardiogram. The rate was 80 instead of 72 and the T wave was poorly deflected in all leads. R_4 was short, and the configuration of $S\text{-}T_4$ suggested a coronary occlusion. These electrocardiograms were interpreted as not normal but not entirely characteristic of coronary occlusion. Although the symptoms were not in every way typical at the onset, the conclusion is that this patient had a coronary thrombosis. Whether the amphetamine inhalation had anything to do with precipitating the occlusion is difficult to determine at this time. The patient himself feels definitely that it had.

Paul S. Rhoads, M.D., Evanston, Ill.